Watershed Action Plan
Santa Ana Region
Riverside County

June 27, 2013

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Acronyms and Abbreviations

ABOP	Antifreeze, Batteries, Oil, Paint
Basin Plan	Water Quality Control Plan for the Santa Ana River Basin
BMP	Best Management Practice
Caltrans	California Department of Transportation
CAP	Compliance Assistance Program
CBRP	Comprehensive Bacteria Reduction Plan

CEQA	California Environmental Quality Act
CGP	Construction General Stormwater Permit
CMP	Consolidated Monitoring Plan
CNRP	Comprehensive Nutrient Reduction Plan
County	Riverside County
CWA	Clean Water Act
DAMP	Drainage Area Management Plan
District	Riverside County Flood Control and Water Conservation District
EEM	Engineered, earthen and maintained
EFHM	Engineered, fully hardened and maintained
EHM	Engineered, hardened and maintained
EIR	Environmental Impact Report
EMWD	Eastern Municipal Water District
EPHM	Engineered, partially hardened, and maintained
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
HCOC	Hydrologic Conditions of Concern
HHW	Household hazardous waste
HMP	Hydromodification Management Plan
IEUA	Inland Empire Utilities Agency
IRWMP	Integrated Regional Water Management Plan
IS	Initial Study
LESJWA	Lake Elsinore and San Jacinto Watersheds Authority
LID	Low Impact Development
MEP	Maximum Extent Practicable
MSAR	Middle Santa Ana River
MSHCP	Multiple Species Habitat Conservation Plan
MS4	Municipal Separate Storm Sewer System
NAT	Natural
NEE	Not engineered and earthen
NRCS	National Resource Conservation Services
2010 MS4 Permit	Riverside County MS4 Permit Order No. R8-2010-0033
OWOW	One Water One Watershed
Permittees	District, County and Cities within the Santa Ana Region
RBF	Robert Bein, William Frost and Associates
RCA	Western Riverside County Conservation Authority
RCTD	Riverside County Transportation Department
RCTC	Riverside County Transportation Commission
RDBMS	Relational Database Management System
Regional Board	Santa Ana Regional Water Quality Control Board
SAR	Santa Ana Region
Santa Ana Region	Portion of Riverside County within the Santa Ana River Watershed
SAWPA	Santa Ana Watershed Project Authority
SCCWRP	Southern California Coastal Watershed Research Project
SMC	Southern California Stormwater Monitoring Coalition

$SWCT^2$	Stormwater and Water Conservation Tracking Tool
SWPPP	Stormwater Pollution Prevention Plan
SWQSTF	Stormwater Quality Standards Task Force
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
USEP	Urban Source Evaluation Plan
USEPA	United States Environmental Protection Agency
WAP	Watershed Action Plan
WMWD	Western Municipal Water District
WLA	Wasteload Allocation
WQMP	Water Quality Management Plan

Executive Summary

The Watershed Action Plan (WAP) for the Santa Ana Region of Riverside County (SAR) and its Permittees is a requirement of the Riverside County Municipal Separate Storm Sewer System (MS4), Permit Order No. R8-2010-0033 (2010 MS4 Permit). The requirement was set forth by the Santa Ana Regional Water Quality Control Board (Regional Board) within the 2010 MS4 Permit, to develop a document using a coordinated watershed approach to address water quality and hydromodification impacts resulting from urbanization within the SAR. This goal is to be achieved by evaluating existing programs relating to the integration of water quality, stream protection, stormwater management, and re-use strategies with land planning policies, ordinances, and plans within each jurisdiction to the maximum extent practicable (MEP). The Regional Board also emphasized that the plans for each jurisdiction should address cumulative impacts of development on vulnerable streams; preserve or restore, consistent with the MEP standard, the structure and function of streams; and protect surface water and groundwater quality.

The WAP was developed through a collaborative process with the Riverside County Flood Control and Water Conservation District (District), the County of Riverside (County) and Cities in the SAR (Co-Permittees) (District and Co-Permittees collectively are the Permittees), and other watershed stakeholders. The WAP is structured to help the Permittees, and stakeholders collaborate with existing programs to take a holistic approach toward watershed management within the Santa Ana River Watershed.

1 WAP Purpose

The purpose of this WAP is to address watershed scale water quality impacts of urbanization in the Permit Area associated with Urban Total Maximum Daily Load (TMDL) Waste Load Allocations (WLAs), stream system vulnerability to Hydromodification from Urban Runoff, cumulative impacts of development on vulnerable streams, preservation of Beneficial Uses of streams in the SAR, and protection of water resources, including groundwater recharge areas. The WAP will also help improve integration of water quality, stream protection, stormwater management, water conservation and re-use, and flood management through an integrated watershed management approach potentially utilizing the Regional Geodatabase as the main tool to inform the development community of this approach.

The primary audience and users of the WAP will be Permittee staff. The WAP will help address potential local and regional water quality impacts associated with development and be a resource tool in the development process. In order to address water quality early in the development process, Permittee staff may utilize the WAP to assist development project proponents to comply with the multitude of plans and programs as required by the 2010 MS4 Permit. The Permittee staff may use the WAP and the associated Regional Geodatabase to better understand the development project site and potential constraints from a water quality perspective, as well as the potential water quality issues a project may contribute. The Regional Geodatabase will allow the Permittees to identify stormwater management facilities and improvements, as well as environmental constraints in the vicinity of a project in their jurisdiction.

The WAP is a resource to enable Permittee staff to address watershed scale water quality impacts through the integration of water quality, stream protection, Urban Runoff management, water conservation and re-use, and flood protection during the development processes. This may be accomplished by:

- Implementation of watershed protection principles and policies necessary for water quality protection, including avoiding disturbance of waterbodies, minimizing changes in hydrology and Pollutant loading, preserving wetlands and other natural areas, using appropriate Best Management Practices, employing the Ahwahnee Principles of community design, using the California Environmental Quality Act (CEQA), Low Impact Development (LID), and others. Watershed protection principles and policies are discussed in further detail in Section 1.3.
- Completion of a Hydrologic Conditions of Concern (HCOC) study that incorporates the delineation of existing unarmored or soft-armored drainages in the SAR that are vulnerable to geomorphology changes due to Hydromodification, and those channels and streams that are engineered, hardened, and maintained.
- Hydromodification Susceptibility Documentation and Mapping Report
- Future development and implementation of a Hydromodification Management Plan (HMP) and development of a Hydromodification Monitoring Plan based on appropriate science and efforts.

- Identification of stream segments vulnerable to Hydromodification.
- Development, testing, and implementation of a watershed geodatabase as a primary interactive reference tool to facilitate the use of the WAP as a guidance document.
- Conducting training workshops and demonstration workshops for the WAP and the associated Regional Geodatabase.
- Develop a schedule to maintain the Regional Geodatabase and other available and relevant regulatory and technical documents associated with the Watershed Action Plan.
- Future development of recommendations for specific retrofit studies in the SAR to address TMDLs and potential Hydromodification issues.
- On-going coordination efforts for all of the Permittees and stakeholders.
- Additional reconnaissance and/or detailed studies relating to specific sites and geographic areas.

The WAP will also assist in identifying other potential stakeholders that may assist with coordination of resources in the SAR to help implement the objectives identified below.

1.1 WAP Objectives

The objectives of the WAP are identified in the 2010 MS4 Permit. Those objectives are:

- Address watershed scale water quality impacts associated with Urban TMDL WLAs;
- Address stream system vulnerability to Hydromodification from Urban Runoff;
- Address cumulative impacts of development on vulnerable streams;
- Preservation of Beneficial Uses; and
- Protection of water resources, including groundwater recharge areas.

The WAP may facilitate an integrated watershed management approach to improve the water quality and quantity control planning and approval processes. Along with the development of an integrated watershed management approach, the WAP describes the Regional Best Management Practice (BMP) approaches used to address Urban TMDL WLAs in the SAR, develop recommendations for specific retrofit studies to address TMDLs and Hydromodification, and describe any other regional effort taking place in the watershed that benefits water quality.

Program-specific objectives for the WAP include:

- Consideration of the watershed protection principles specified in Section 1.3;
- Consideration of the Permittee's planning and procedure review covered in Section 1.4;
- Identification of linkages between the WAP and the Stormwater Quality Standards Task Force (SWQSTF), Drainage Area Management Plan (DAMP), Water Quality Management Plan (WQMP), the implementation of LID, and the TMDL Implementation Plans;

- Development of a structure for the WAP that emphasizes coordination of watershed priorities with the Co-Permittees' Local Implementation Plans (LIP) identification of other relevant existing watershed efforts, such as the Chino Basin Master Plan, Santa Ana Watershed Project Authority's (SAWPA) Integrated Regional Water Management Plan (IRWMP), etc., and their potential role in the WAP;
- Identification of Impaired Waters [Clean Water Act (CWA) § 303(d) listed] with identified Urban Runoff Pollutant sources causing Impairment, existing monitoring programs addressing those Pollutants, existing monitoring programs addressing these Pollutants, control measures, any BMPs that the Permittees are currently implementing, and any BMPs the Permittees are proposing to implement to address the Impaired Receiving Waters;
- Consideration of potential impediments to implementing regional and retrofit BMPs, as well as watershed protection principles during the planning and development processes, including but not limited to LID principles and management of the impacts of Hydromodification;
- Inclusion of the Hydromodification Mapping Study on the watershed Regional Geodatabase and will be available to watershed stakeholders via the Internet, and has incorporated the following information:
    - Delineation of existing non-armored or soft-armored drainages in the SAR that may be vulnerable to geomorphological changes due to Hydromodification. Delineation of those channels and streams that are engineered, hardened, and maintained (EHM);
    - Potential causes of identified stream degradation including a consideration of sediment yield and balance on a watershed or sub-watershed basis; which will be developed as part of the Hydromodification Management Plan
    - Geographic Information System (GIS) layers for known sensitive species, protected habitat areas, drainage boundaries, and potential stormwater recharge areas and/or reservoirs; and
    - Available and relevant regulatory and technical documents accessible via hyperlinks;
- Development and maintenance of the watershed geodatabase, and development of a draft schedule for expected enhancements to increase functionality;
- Review of the Regional Geodatabase with applicable resource agencies, including but not limited to the Regional Board staff from the Stormwater TMDL and Watershed Planning/Program Sections, Permittees, stakeholders, SAWPA, utility agencies, environmental and resource conservation districts, and other interested and related parties. The review process is intended to verify attributes of the Regional Geodatabase, including the Hydromodification Mapping Study, and the intended use of the Regional Geodatabase to support regulatory processes (i.e., WQMP) and LID BMP feasibility evaluations;

- Description of Regional BMP approaches used to address Urban TMDL WLAs in the SAR;
- Recommendations for specific retrofit studies to address TMDLs and Hydromodification, and describe any other regional effort taking place in the SAR that benefits water quality;
- Identification of contributing jurisdictions and the stream segments that will benefit from coordination; and
- Submittal of the Draft WAP to the Executive Officer for approval.

1.2 Watershed Protection Principles

The following baseline watershed protection principles identified in Section XII.C.2. of the 2010 MS4 Permit are incorporated in the WAP:

- Limit disturbance of natural waterbodies and drainage systems; conserve natural areas; protect slopes and channels; minimize significant adverse impacts from Urban Runoff on the biological integrity of natural waterbodies and drainage systems;
- Minimize changes in hydrology and Pollutant loading; require incorporation of controls, including Source Control and Treatment Control BMPs to mitigate any projected increases in Pollutant loads and flows; reduce post-development runoff rates and velocities from a site to mitigate downstream erosion and stream habitat; minimize the quantity of Urban Runoff directed to impermeable surfaces and the MS4; and maximize the percentage of permeable surfaces to allow more percolation of Urban Runoff into the ground;
- Preserve wetlands, riparian corridors, and buffer zones that provide important water quality benefits; and establish reasonable limits on the clearing of vegetation from the project site;
- Encourage the use of BMPs to manage Urban Runoff quantity and quality, consistent with Section XII.C.1. of the 2010 MS4 Permit;
- Provide for permanent measures to reduce Pollutant loads in Urban Runoff from the development site; and
- Establish development guidelines for areas particularly susceptible to erosion and sediment loss.

Additional watershed protection principles include:

Ahwahnee Principles

- Natural resources, such as wetlands, flood plains, recharge zones, riparian areas, and open space, should be identified, preserved, and restored as valuable assets for such uses as flood protection and water quality improvement.
- Water holding areas, including creek beds and recessed athletic fields, should be incorporated into urban landscapes.

- Permeable surfaces should be used for hardscape, with impervious surfaces minimized, so that land is available to absorb stormwater, reduce polluted runoff, recharge groundwater, and reduce flooding.
- Dual plumbing should be used to allow the use of grey water for landscape irrigation in new development.
- Community design should maximize use of recycled water for landscape irrigation, toilet flushing, and commercial/industrial uses, with purple pipe installed in new construction and redevelopment in anticipation of future recycled water use.
- Water conservation technologies for new construction and retrofits should be incorporated into new construction and redevelopment.
- Locally available, drought-proof water supplies (e.g., groundwater treatment and brackish water desalination) should be maximized.

1.3 Planning Development Process Overview

This section provides a general description of the typical planning development process. This overview addresses the necessary steps for incorporation of WAP measures throughout the planning process by a typical Co-Permittee. It should be noted that the District does not have land use authority and does not approve development projects.

Initial Development Project Meeting with Agency Planning Staff

The first presentation of a New Development project typically takes place in an initial meeting with the Co-Permittee planning staff. In the meeting, the development project proponent presents the scope and location of the project proposed. Preliminary plans for the project are presented, and the planning staff asks questions and provides initial input about the project as well as makes a determination of whether or not the proposed project is appropriate under the general plan, specific plan, and/or zoning of the area requested.

At this stage, the WAP may be referenced. The WAP and associated Regional Geodatabase is designed to be a tool for agency planners to assist in accomplishing an integrated watershed management approach to project development and ultimately improve water quality. The WAP should also be used by the Permittee planning staff as a tool to understand the issues and elements of integrated watershed management.

To utilize this tool successfully, the WAP should be used at this earliest stage of the project planning process. The WAP should be used by Permittee planning staff to identify the potential effects of the project on water quality, both from a Project-Specific basis and from a cumulative impact basis based on the surrounding development. Additionally, the Regional Geodatabase Stormwater and Water Conservation Tracking Tool ($SWCT^2$) should be referenced by Permittee planning staff to identify the physical characteristics of the project site, as well as identify the associated existing regional studies.

Once the Project-Specific impacts have been explored, the Co-Permittee planning staff should make initial Project-Specific recommendations to the proponent, explaining how to incorporate

integrated watershed management and watershed protection principles identified in the WAP into the project design prior to the filing of an application for the entitlement to develop the project.

Project Submittal (Pre-Approval)

Once Co-Permittee planning staff has completed initial project evaluation/consultation with the developer, a preliminary WQMP (if applicable) should be submitted along with the initial checklist items. Preliminary WQMPs identify the potential water quality measures that will be incorporated into the project design. One of the advantages of having a preliminary WQMP is to implement water quality mitigation within the design of the project.

The project proponent should utilize the WAP to provide guidance in development of project features which demonstrate consistency with coordinated development and management of water and land resources. The project proponent will be given access to the WAP document and the $SWCT^2$ to assist with this effort.

The preliminary WQMP for the project will be evaluated by appropriate agency staff for adequacy and appropriateness for the project design. If the preliminary WQMP is deemed to be adequate, the project will then be deemed a complete filing (assuming all other submittal requirements have been met) and would move forward into the entitlement process.

CEQA Analysis

Discretionary development projects are subject to review under CEQA. CEQA analysis covers environmental effects of a project, including potential impacts to water quality. The primary vehicle for CEQA analysis is the CEQA initial environmental study checklist [Initial Study (IS) or CEQA checklist]. An IS is performed and, if substantial impacts are identified, an Environmental Impact Report (EIR) is then prepared. If identified impacts are non-significant or non-significant once mitigation is applied, a Negative Declaration is prepared.

The preliminary WQMP should be considered during the CEQA analysis to assist in assessing the level of project impact and the formulation of effective mitigation measures. Evaluation guidelines pertaining to water quality impacts should be prepared by the local agencies to standardize the analysis of this part of the IS or EIR.

Project Approval

In addition to the CEQA analysis, the project will be reviewed by all affected agencies and departments for their specific project approval requirements. At the end of this review, the Permittee planning staff will assemble all necessary conditions of approval, required mitigation measures and design considerations, and assist the project proponent in developing the final project design that can be approved by the lead agency subject to these conditions and mitigation measures. The project recommendations should be coupled with the specific water quality requirements the project will need to implement at the project site. The recommendations and identification of water quality requirements will be documented in the WQMP noted in the conditions of approval and included in the approved final project design.

Final WQMP

Once the final design of the project has been issued entitlement approval subject to conditions, the Final WQMP is developed in collaboration with the final designs of the project and is usually submitted to the Co-Permittee planning department with the grading plan prior to issuance of a grading permit. The Final WQMP should substantially conform to the preliminary WQMP.

The Final WQMP should consider any design changes required from the time of the preliminary WQMP and also address any new impacts that were identified in the CEQA process. The Final WQMP must obtain approval from appropriate agency staff prior to the construction phase of the project.

Grading Plan

Once a final design of the project is developed, a grading plan is submitted to the Co-Permittee planning department for review and approval. The grading plan components include:

- Detailed Grading Plan;
- Elevations, dimensions, location, extent, and slope of proposed grading;
- Approved Tentative Map or Site Plan;
- Preliminary Title Report;
- Soils Report;
- Hydrology and Hydraulics Study; and
- Stormwater Pollution Prevention Plan (SWPPP).

The Grading Plan must receive review and approval from Co-Permittee planning staff prior to the construction phase of the project.

2 Watershed Resources and Characteristics

2.1 Location

The Santa Ana River Watershed, inclusive of the flood control zones identified above, is located in southern California, south and east of the City of Los Angeles. The Santa Ana River Watershed includes much of Orange County, the northwestern corner of Riverside County, the southwestern corner of San Bernardino County, and a small portion of Los Angeles County. Tributaries of the Santa Ana River within Riverside County include the San Jacinto River Watershed and the Middle Santa Ana River Watershed. The San Jacinto River Basin, a 768-square mile tributary of the Santa Ana River, is regulated by natural storage in Lake Elsinore and contributes flow into the Santa Ana River only as a result of rare high intensity storm events that cause overflow. The Santa Ana River Watershed is bound on the south by the Santa Margarita Watershed,, on the east by the Whitewater Watershed and on the northwest by the San Gabriel River Watersheds. The area of the Santa Ana River Watershed is approximately 2,650 square miles.

The headwaters of the Santa Ana River are in the San Bernardino Mountains with its major tributary being the San Jacinto River, originating in the San Jacinto Mountains. The San Jacinto River flows through Canyon Lake, Lake Elsinore and Temescal Creek to confluence with the Santa Ana River in the City of Corona.The Santa Ana River then traverses through Prado Dam before cutting through the Santa Ana Mountains and flowing to the Orange Coastal Plain. Eventually, the river discharges to the ocean in the city of Huntington Beach.

2.2 Physiography

At just over 7,200 square miles, Riverside County is rectangular shaped and is bordered on the west by Orange County; on the southwest by San Diego County; on the southeast by Imperial County; and on the north by San Bernardino County. Combined, San Bernardino and Riverside Counties are called the Inland Empire. The District encompasses portions of three major river basins in Riverside County: the Santa Ana River, the Santa Margarita River, and the Whitewater River.

Major topographic features within the Santa Ana River Watershed include the Santa Ana, San Jacinto, and San Bernardino Mountains. The Santa Ana Mountain Range trends southeasterly along the western border of Riverside County, with a maximum elevation of 5,687 feet at Santiago Peak. The Santa Ana Mountains create a barrier between the Pacific Ocean and inland valleys of Riverside County. The major topographic barrier in the County is located about 50 miles east. The San Bernardino and San Jacinto Mountain Ranges run southeasterly across Riverside County with maximum elevations at 10,804 feet at the San Jacinto Peak and 11,502 feet at the San Gorgonio Mountain. Near the northern boundary of the County, the San Gorgonio Pass is a major breach of the barrier with elevations dropping approximately 2,600 feet. Between the Santa Ana and San Bernardino-San Jacinto barriers is an area of broken topography that includes valleys, plateaus, and minor mountain ranges.

2.3 Land Use

The Santa Ana River Watershed includes portions of Riverside, Orange and San Bernardino Counties, and is substantially urbanized with approximately 32% of the land being residential, commercial, or industrial. Riverside County has seen a change in land uses throughout time. Historically, the inland valleys have been vastly devoted to agriculture; however, over the past few decades, urbanization has risen rapidly and a majority of that land has been developed. Agricultural land now makes up approximately 10% of the watershed, and the watershed is home to approximately five million people.

2.4 Geology

Soil depths in the mountainous areas of the Santa Ana Region are shallow. On many of the steepest slopes, the soil cover does not exist, exposing the bedrock. The feasibility for infiltration in these areas is not promising. Alluvial soils are predominant in the valley areas of the County, but vary with respect to depths and types of alluvial deposits. Generally speaking, alluvial cones/fans near canyon mouths are coarse and highly porous. Deposits farther downstream tend to become finer and less porous. Certain areas of the valley have very slow/non-existent infiltration rates due to the high clay content in the alluvium.

2.5 Climate

The climate of the SAR is Mediterranean with hot, dry summers and cool, wet winters. Average annual precipitation ranges from 10-13 inches per year in the inland alluvial valleys, reaching 36 inches or more in the San Jacinto Mountains. Most of the precipitation in the Santa Ana River Watershed occurs between November and March, with variable amounts of snow at higher elevations.

The SAR's climate cyclicality results in high surface water flows in the spring and early summer followed by low flows during the dry season. Winter and spring floods generated by storms are not uncommon in wet years. There are several types of storms that occur in the Santa Ana River Watershed. General winter storms occur during the period of December to March. They originate over the Pacific Ocean as a result of the interaction between polar Pacific and tropical Pacific air masses and move eastward over the basin. These storms, which often last for several days, reflect aerographic influences and are accompanied by widespread precipitation in the form of snow or rain. General summer storms usually occur during the period from July through September. They are associated with an influx of tropical maritime air originating over the Gulf of Mexico or the South Pacific Ocean and enter the area from a southeast to a southwest direction. Usually, the influx of tropical air is caused by circulation about a high-pressure area centered in the southeastern United States, but occasionally it is caused by the remnants of a tropical hurricane. General summer thunderstorms are accompanied by heavy precipitation over large areas for periods up to 24 hours, but showers may continue for as long as three days.

Local thunderstorms can occur at any time of the year, either during general storms or as isolated phenomena. They are most common, however, during the period from July through September, when the Southern California area may be covered by moist unstable air originating over the

Gulf of Mexico. These storms cover comparatively small areas and result in high intensity precipitation of short duration.

2.6 Water Resources

The surface waterbodies in the SAR include: Santa Ana River (Reaches 3 and 4), San Jacinto River Basin, San Timoteo Creek Basin, Canyon Lake, Lake Elsinore, Lake Evans, Lake Fulmor, Lake Hemet, Lake Mathews, Lake Perris, Lee Lake, and Mockingbird Reservoir.

Tributaries to the Santa Ana River (Reaches 3 and 4) include: Temescal Creek (Reaches 1-6), Tequesquite Arroyo (Sycamore Creek), Day Creek, and San Sevaine Creek.

Tributaries to the San Jacinto River Basin include: San Jacinto River (Reaches 1-7 and North Fork), Bautista Creek, Fuller Mill Creek, Salt Creek, Strawberry Creek, Stone Creek, Indian, Hurkey Poppet, and Potrero.

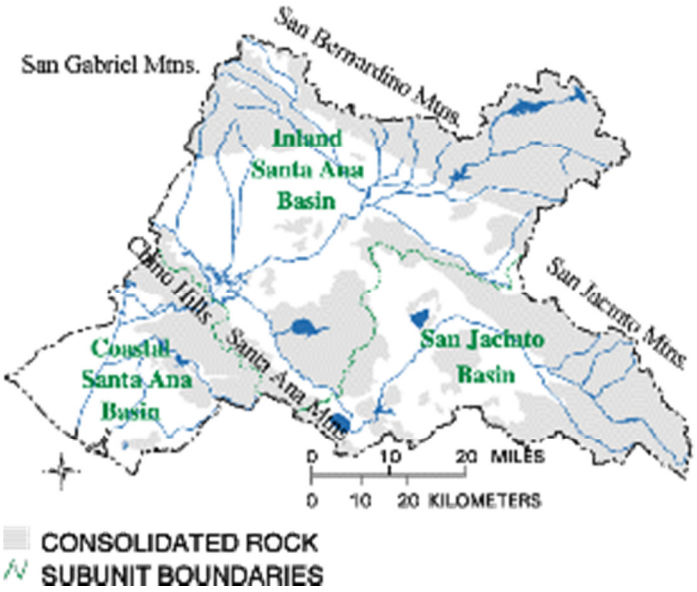
Tributaries to the San Timoteo Creek Basin include: San Timoteo Creek (Reaches 3 and 4) and Little San Gorgonio Creek.

The Beneficial Uses of the aforementioned surface waterbodies include municipal and domestic water supply, agricultural supply, industrial service supply, industrial process supply, groundwater recharge, water contact recreation, non-contact water recreation, warm freshwater habitat, cold freshwater habitat, wildlife habitat, and preservation of rare and endangered species. As many of the stream segments in the SAR are ephemeral, not all of these Beneficial Uses are consistently supported.

2.7 Groundwater

Groundwater basins within the SAR are used to store local and imported water for later use to meet seasonal and drought-year demands. Groundwater is artificially replenished during wet years or in emergency situations. In some cases, when reclaimed water is recharged into the groundwater basins, the County's ability to meet water demand during years of reduced supply is increased, and the reliability of the supply is enhanced. There are two groundwater basins located within the SAR: the Inland Santa Ana Basin, and the San Jacinto Basin. The location of each basin is shown in Figure 3 below.

Figure 1: Groundwater Basin Locations in Santa Ana River Watershed



The Inner Santa Ana Basin is located in the upper portion of the Santa Ana River Watershed, north of both Prado Dam Basin and the San Jacinto Basin. The Inland Basin is located in portions of Los Angeles, Riverside, and San Bernardino Counties and is comprised of alluvial deposits eroded from the surrounding mountains, varying in depth from less than 200 feet to more than 1,000 feet. The basin is recharged seasonally by infiltration of runoff from the San Gabriel and San Bernardino Mountains and also by water imported from Northern California and the Colorado River. Depths of water range from about hundreds of feet from the bottom of the mountain ranges to near the land cover in close proximity to rivers and wetland areas. The San Andreas Fault and other faults bound the Basin on three sides. The San Jacinto Fault subdivides the Basin. The interior faults are critical because they locally restrict groundwater flow and dictate the location of groundwater discharge. Groundwater management in the area is provided by Inland Empire Utilities Agency (IEUA), Western Municipal Water District (WMWD), Three Valleys Municipal Water District (Three Valleys), Elsinore Valley Municipal Water District (EVMWD), and Eastern Municipal Water District (EMWD).

The San Jacinto Basin is a series of interconnected, alluvium-filled valleys surrounded by steep sides of bedrock mountains and hills. The deposits range in thickness from approximately 200 to 1,000 feet. Collectively, alluvium covers about one-half of the total area in the subunit. Before the development of the area, groundwater recharge to the flow system was provided by infiltration of mountain streams, most notably the San Jacinto River. Today, groundwater recharge is largely from irrigation return flows and from percolation ponds filled with reclaimed water. Ground-water discharge occurs primarily by groundwater pumpage. Water levels in the alluvium-filled sub-basins are greatly affected by local management practices, including augmentation of groundwater pumpage by use of imported water and recharge with reclaimed water. Along with groundwater management, EMWD also provides monitoring and water

supply to various cities, including Moreno Valley, Perris, Sun City, Menifee, Winchester, Nuevo, Homeland, Hemet, San Jacinto, and Valle Vista.

3 Regional Water Quality Efforts

3.1 Regional Watershed Efforts

Linking all of the important components and efforts related to the SAR creates an efficient and effective strategy in order to meet the 2010 MS4 Permit requirements. Important efforts include Regional BMPs, SWQSTF, IRWMP, LID, DAMP, LIP, WQMP, TMDLs, Chino Basin Master Plan, SAWPA, Western Riverside County Conservation Authority (RCA), and groundwater protection and clean-up. In 2012, the Regional Geodatabase was created for the SAR. This map is known as the "Stormwater and Water Conservation Tracking Tool", referred to as $SWCT^2$ and is the WAP's central component. The $SWCT^2$ integrates these efforts along with a variety of equally important components to the SAR into a centralized location accessible to project proponents through an online portal. The $SWCT^2$ is discussed in more detail in Section 5.

3.1.1 Regional Treatment Control BMP's

Regional Treatment Control BMPs are an important tool in the water quality improvement toolbox. The factors that should be considered for implementation and approval of Regional Treatment Control BMPs include location, type, effectiveness for the target Pollutants of Concern, tributary drainage area, site constraints and constructability, engineering feasibility, operation and maintenance requirements, monitoring protocol, adjacent land uses, and funding sources. The permittees continue to evaluate Regional BMP implementation plans and strategies within the SAR.

3.1.2 Regional Retrofit Opportunities

The SAR BMP Retrofit Assessment (Retrofit Study) provides the Permittees with recommendations for retrofit studies of possible sites such as MS4, parks and recreational areas that incorporate opportunities for addressing TMDL Implementation Plans and LID implementation. The Retrofit Study was drafted to aid the Permittees in their efforts to effectively implement the requirements of the approved CBRP for the MSAR TMDL. The possible retrofit BMP opportunities identified in this study are incorporated into the WAP.

Before final selection and implementation of these identified potential retrofit location(s) can occur, benefits to the Receiving Waters in the SAR must be assessed (described in section 4.5.4). After this assessment of Receiving Water benefits and prioritization is performed, a Project-Specific detailed design and engineering analysis must be accomplished to demonstrate that the original uses (such as flood control and drainage) of the facility are not compromised. Cost estimating, environmental, and regulatory permit work must also be conducted, and property or lease restrictions must be investigated to address barriers that would preclude implementation of a potential BMP retrofit project (e.g., a park parcel with narrowly-defined recreational use restrictions).

The District and permittees continue to evaluate hydromodification as it relates to flood risk and prioritize project opportunities within their respective capital improvement programs and land development processes.

3.1.3 Stormwater Quality Standards Task Force

The SWQSTF includes representatives from the Regional Board, Orange, Riverside and San Bernardino Counties, Cities, environmental special interest groups, and others interested in water quality issues within the Santa Ana River Watershed. The SWQSTF was formed in 2003 to assist the Regional Board in providing the scientific and technical basis for modifications to existing Bacterial Indicator quality objectives for recreational uses. They have led recommendations for changes in recreational use designations and implementation strategies, specifically related to the standards regarding body contact with water during recreational activities where ingestion of water is reasonably possible. These uses include, but are not limited to swimming, wading, water-skiing, skin and scuba diving, surfing, whitewater activities, fishing, and uses of natural hot springs inclusive of the entire Santa Ana River Watershed and coastal waters. Water contact implies a risk of waterborne disease transmission and involves human health. Accordingly, criteria that are more stringent are required to protect this use than criteria for more casual water-oriented recreation. The SWQSTF has also led a basin-wide assessment of the current conditions of receiving waters, the nature of recreational uses, and areas where additional data or information is needed. SAWPA is a member of the SWQSTF and serves as the group administrator. The SWQSTF is working toward integration of water quality standards in the entire Santa Ana River Watershed and is currently in the process of obtaining a Basin Plan amendment for REC-1 use in the Santa Ana River.

3.1.4 Integrated Regional Water Management Planning – "One Water One Watershed"

Due to the dwindling natural potable water supply and increased water demand from population growth and urban development, the need for a sustainable water balance solution becomes more evident every day. Regional partnerships have expanded throughout the Santa Ana River Watershed to develop a solution for this problem. The Integrated Regional Water Management Plan also known as One Water One Watershed (OWOW), has identified the four major threats as reduction in water supplies from climate change combined with increased water needs; continuing drought in the Colorado River Region resulting in reductions of imported supply due to upper Santa Ana River Basin entitlements and continued long-term drought; reduction or loss of supply due to levee failure or changing management practices in the Delta Sacramento/San Joaquin Delta; and, interruptions in hydrology and groundwater recharge caused by population growth and development. To attain the long term Year 2030 vision for the Santa Ana River Watershed that is drought-proofed, salt-balanced, and supports economic and environmental viability, the next generation of IRWMP must be implemented.

IRWMP incorporates collaborative local partnerships which integrate regional watershed planning in order to solve problems on a regional scale and give all water interests a voice in the planning process. IRWMP has developed a fundamental plan which integrates a comprehensive planning tool to educate everyone involved in the 2010 MS4 Permit on the logistics of water supply and demand. An understanding of where water originates and how it is used helps resolve the water supply issue by increasing awareness and responsibility with the public. The method for resolving the water supply issue is through water quality permits and use of effective

tools such as the SWCT[2]. The IRWMP or OWOW Plan, is located at the following link: www.sawpa.org/owow/the-plan/.

3.1.5 Chino Basin Master Plan

The Chino Basin Master Plan evolved from an integrated renewable energy plan, including organics management, biosolids, and regional co-composters, into a regional plan to also include managing water use and protecting and improving open space and wildlife habitat in this quickly urbanizing area. Improvements to the water treatment and delivery systems, Prado Basin activities, stormwater BMPs, natural treatment systems for water quality improvement, LID concepts, local development proposals, and recreation and trail systems are now being incorporated into the master plan. Dairy waste runoff, increased soil erosion, and increased stormwater flows with their resultant pollutants, have not only degraded water quality, but have also caused channel incision, loss of habitat, decreased infiltration and increased flooding within the Chino Basin. Continuation and expansion of these practices necessitates implementing sustainable approaches to LID and implementing barriers to control the entrance of contaminants and high flows into Receiving Waters. The inclusion of natural treatment approaches to water quality improvement and flood flow reduction will provide opportunities for important habitat improvements and valuable passive and active recreation opportunities. The Chino Basin Master Plan also contains a Salt Management Program to eliminate water quality problems in the Chino Basin associated with nitrogen salt. The Salt Management Program includes an ad-hoc committee to review cooperative strategies set forth by the Regional Board. The goal of the Chino Basin Master Plan is to evaluate and refine opportunities for multiuse and multiple purpose projects that improve water quality, flood protection, habitat and recreation and to identify the steps to implementation of these projects. The Chino Basin Master Plan is an integral component of the WAP and needs to be incorporated into the watershed improvement efforts. Updates and planned activities will be included in the online SWCT[2] so the Permittees can monitor and include the ongoing activities of the Chino Basin Master Plan.

3.1.6 Santa Ana Watershed Project Authority Integrated Regional Water Management Plan

SAWPA, a member and administrator of the SWQSTF, plays an integral role in protecting and restoring the water resources of the Santa Ana River Watershed. SAWPA has implemented an IRWMP to help restore and create a sustainable Santa Ana River. The main goal of this plan is to have a drought-proofed, salt-balanced watershed that supports economic and environmental vitality in the year 2030. The IRWMP unites the watershed and coordinates expertise, efforts, and resources to accomplish a sustainable environment. The plan addresses all water-related problems and capitalizes on SAWPA Member Agencies' successful reputation in watershed-wide planning and problem solving. It envisions a single unified submittal to the State, engenders a collaborative approach to solving problems, allows influence on projects over which the Permittees have no authority, and addresses systematic and long-term needs. The IRWMP is another integral component of the WAP and needs to be incorporated into the watershed improvement efforts. Updates and planned activities will be included in the SWCT[2] so the Permittees can monitor and include the ongoing activities of the Chino Basin Master Plan.

The SAWPA website (www.sawpa.org) includes links to the SWQSTF, its work products, and relevant documentation, including statutes, regulations, and guidance, considered by the Task Force in developing the proposed amendments.

3.1.7 Groundwater Protection Procedures

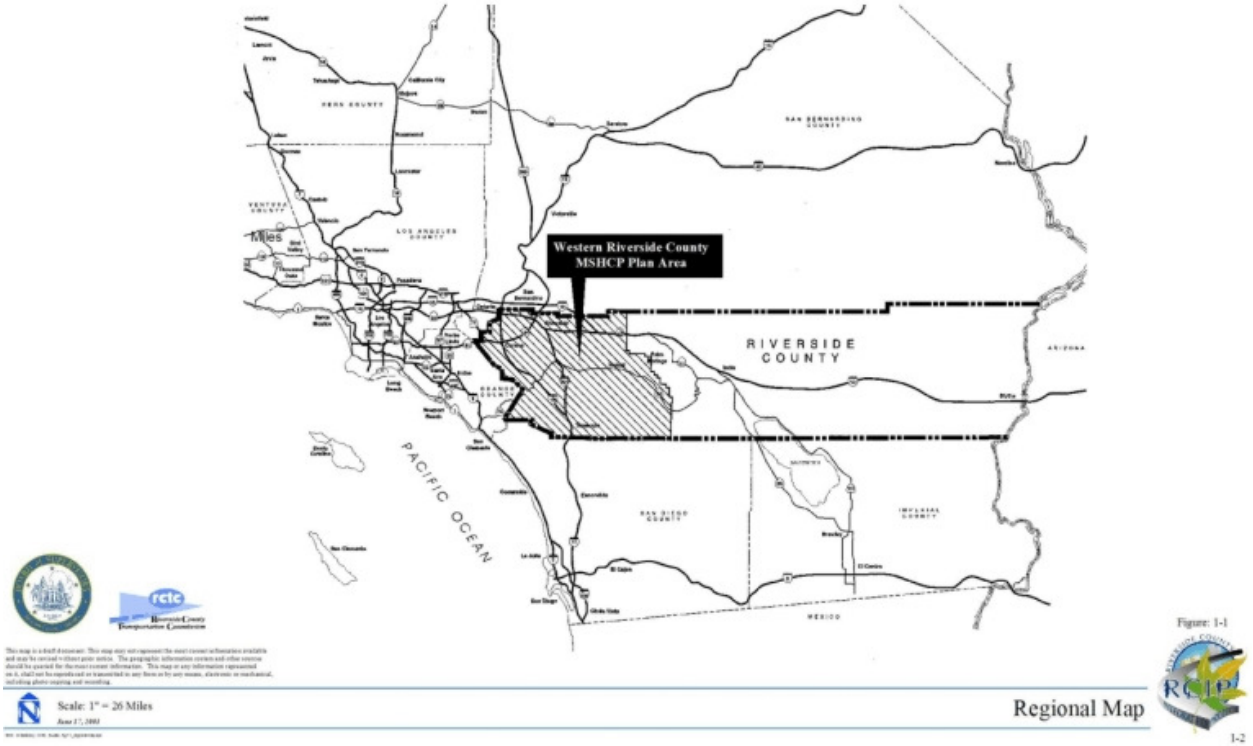
The significantly increasing population in the SAR is putting a high demand on limited groundwater supplies. Much of the groundwater in the SAR is experiencing a buildup of salts, and many of the groundwater basins exceed water quality objectives or are projected to exceed water quality objectives in the future. This is primarily a result of salts added by historic irrigated agriculture, historic municipal and industrial discharges, historic and current dairy operations, and the increase in salt concentrations resulting from reuse and recycling of groundwater. The Regional Board initiated a total watershed approach for salt control beginning with the 1975 Basin Plan. The Total Dissolved Solids (TDS) Management Plan, developed through extensive ground and surface water modeling of the Middle, Upper Santa Ana River, and Elsinore/San Jacinto River Basins, contains specific water supply, wastewater, and groundwater management plans for the Region in order to control salt loadings from residential, commercial, industrial, and agricultural sources. Groundwater issues, protection plans, and recharge and monitoring locations will be included in the $SWCT^2$ to allow the Permittees to access and track this vital information. The District is coordinating with water agencies in the permit area to ensure the protection of groundwater resources. As this information is obtained it will be integrated into the $SWCT^2$ so that plan checkers can use the $SWCT^2$ in review of WQMPs in the land use approval process to ensure groundwater resources are not impacted by development.

Additionally SAWPA has developed an interactive water quality map allowing users to review areas which contain water quality objectives within specific groundwater management zones throughout the watershed. With a valid login, users may view groundwater management zones containing TDS concentrations which exceed Beneficial Use Objectives and well concentrations for TDS throughout the different groundwater management zones. The online map can be found by visiting SAWPA at the following site www.sawpa.net/ .

3.1.8 Western Riverside County Conservation Authority

Rapid population growth throughout Riverside County in the 1980s and 1990s led to traffic congestion, increasing endangered species, and a variety of other environmental degradation concerns. In order to address these rising impacts, the RCA was created in 2004 to implement "one of America's most ambitious environmental efforts", known as the Multiple Species Habitat Conservation Plan (MSHCP). This plan aims to protect hundreds of native species of plants and animals and preserves a half million acres of their habitat. In conjunction with protecting the environment, the MSHCP allows the development and transportation infrastructure necessary for a healthy economy to move ahead without sacrificing the Santa Ana Region and Santa Margarita Region's environment and quality of life. The MSHCP is a unified plan to guide local development and provide for economic growth while protecting the environment. A map of the area covered by the MSHCP is identified in Figure 2 below.

Figure 2: MSHCP Map



Source: MSHCP Website: http://www.rctlma.org/mshcp/volume1/sec1.html#1.1

The MSHCP was adopted by Riverside County and the Cities of Banning, Beaumont, Calimesa, Canyon Lake, Corona, Hemet, Lake Elsinore, Menifee, Moreno Valley, Murrieta, Norco, Perris, Riverside, San Jacinto, Temecula, and Wildomar. In addition, the District, Riverside County Parks and Open Space District, Riverside County Waste Management Department, Riverside County Transportation Commission (RCTC), California Department of Transportation (Caltrans), and the California Department of Parks and Recreation also participated.

According to the RCA, the MSHCP covers 1.26 million acres of western Riverside County,40% of which is designated for preservation. Of that half million acres, 69% is already conserved as public or quasi-public land. The acquisition of the remaining land is one of the most important activities of RCA. To date, more than 27% of the remaining goal of 153,000 acres has been acquired. All together, Riverside County has reached 77% of the goal in the MSHCP.

While reserve acquisition is RCA's core activity, RCA must also monitor development or "habitat-loss" within the MSHCP, review applications for infrastructure or development projects by public agencies and other regional entities like electric and gas utilities, monitor the species being protected, and manage the lands it acquires. RCA generates revenue to facilitate these operations as well as acquire additional land through fees from project proponents involved in construction or land development within any area specified as a "Criteria Area." According to RCA's website "Any individual, business, or public agency wishing to construct a project within the Criteria Area covered by the MSHCP must obtain an approval from RCA and a permit for

the project from the local agency responsible. Approved projects pay fees both for the review of the project, called Joint Project Review and for constructing the project itself." This is the nexus between the Permittees responsibility under the MSHCP and measures implemented as part of the land use approval process as the Permittee as the local agency reviews land use development applications in the MSHCP and comments on the measures appropriate for protection and mitigation in the MSHCP.

The MSHCP has identified habitat adjoining the core areas and linkages by which species could be expected to move from one area of conserved habitat to another. These areas of adjoining land and linkages are at the heart of the MSHCP. They comprise the area to which the MSHCP "criteria" are applied to and from which the 153,000 acres are being acquired. This Criteria Area has been divided into cells or cell groupings for organizational and evaluation purposes.

Every year, RCA issues an Annual Report to update its members and the public on its progress. RCA plays an integral role in the SAR. Although RCA has developed their own online mapping tool, the SWCT^2 should incorporate existing and future land acquired by RCA, as well as the protected areas within their property limits.

Additionally the SWCT^2 includes identified sensitive habitats throughout the permit area including those outside of the MSHCP. These GIS layers in the SWCT^2 can be used by both developers and plan checkers to either avoid the sensitive habitats or identify what areas would require habitat mitigation for development.

3.2 Linkages to Urban Runoff Programs

The 2010 MS4 Permit requires Urban Runoff programs that are being implemented in the SAR by each of the Permittees. LID design strategies, DAMP programs, master drainage plans (MDPs), LIPs, and WQMPs are summarized in this section to cover the existing approaches taken by the Permittees. The following programs are related to such efforts within the SAR and can be found online through the Regional Board website:

- 2010 MS4 Permit;
- LIP;
- Comprehensive Nutrient Reduction Plan (CNRP);
- Comprehensive Bacteria Reduction Plan (CBRP)
- MDPs;
- WQMP;
- DAMP; and
- Consolidated Monitoring Plan (CMP).

Implementation of these programs collectively address Urban Runoff in the SAR and water quality levels are maintained and improved. Watershed drainage area specific programs vary depending on jurisdiction as some jurisdictions have MDPs, water agencies, encroachment permit processes in addition to the WQMP processes.

3.2.1 Low Impact Development Implementation

LID, also referred to as green infrastructure, is viewed as a cost-effective and environmentally preferable approach for the control of stormwater pollution and minimization of Receiving Water impacts associated with development. LID incorporates planning and design policies that mimic pre-development hydrology. LID techniques promote the reduction of impervious areas which may achieve multiple environmental and economic benefits in addition to enhanced water quality and supply, stream and habitat protection, cleaner air, reduced urban temperature, increased energy efficiency, and other community benefits such as aesthetics, recreation, and wildlife areas.

Incorporating LID into the planning and design process of every project would greatly benefit the watershed and its inhabitants. LID is a site planning strategy that uses a water balance approach to reduce Pollutant loads to Receiving Waters. Targeting all of these projects will assist in addressing maintenance, restoration, and improvement of water quality in their design. The 2010 MS4 Permit requires LID techniques to be incorporated within project WQMPs.

3.2.2 Drainage Area Management Plan

According to the 2010 MS4 Permit, the latest DAMP, revised by the Permittees in 2011, identifies programs and policies, including BMPs, to achieve Water Quality Standards in the Receiving Waters. These BMPs can be organized into two categories: BMPs for existing facilities and BMPs for New Development and Significant Redevelopment. Both categories include regulatory activities, public education programs, waste management, and operations and maintenance activities. The Co-Permittees are currently implementing the 2011 DAMP which defines appropriate implementation strategies and standards for development activities. The DAMP is a dynamic document which is constantly undergoing revisions to incorporate the latest technologies and practices associated with water quality and stormwater management.

The DAMP also documents all of the specific stormwater-related activities carried out by the Permittees during the term of the 2010 MS4 Permit. This acts as an important organizational tool enabling all of the Permittees to stay informed and updated on completed tasks and planned goals. Integrating DAMP principles into the WAP and incorporating it into the $SWCT^2$ will be a beneficial tool to help keep everyone informed on the latest activities in the SAR. Ultimately, the WAP is required to be incorporated into the latest DAMP. The Permittees are required to incorporate applicable provisions from the revised DAMP into the LIPs for SAR-wide coordination of the WAP.

3.2.3 Local Implementation Plan

As summarized in the 2010 MS4 Permit, the LIP template was created to facilitate a description of the Permittees' individual programs to implement the DAMP. This includes the organizational units responsible for implementation and identification of positions responsible for Urban Runoff program implementation. The description for each Permittee addresses the overall program management, including internal reporting requirements and procedures for communication and accountability, including:

- Interagency/interdepartmental agreements necessary to implement the Permittees' Urban Runoff program;
- A summary of fiscal resources available to implement the Urban Runoff program;
- The ordinances, agreements, plans, policies, procedures, and tools used to execute the DAMP, including legal authorities and enforcement tools;
- A summary of procedures for maintaining databases required by the 2010 MS4 Permit; and
- A description of internal procedures to promote accountability

The LIP also covers TMDL requirements, if required, logistics regarding legal authority/enforcement procedures and compliance tracking, Illicit Connections/Illegal Discharges programs and responsibilities, litter, debris and trash control, sewer spills/leaks/failure inspection, maintenance and response coordination, construction site Construction General Permit (CGP) permitting and BMP implementation procedures, implementation of the Residential Program, New Development and Significant Redevelopment, WQMP and HMP implementation, descriptions of the credit programs, public education and outreach, a description of the Permittees' MS4 facilities and activities (see 2010 MS4 Permit for complete list), and training programs for Stormwater Managers, Planners, Inspectors and Permittee contractors.

Permittees are required to annually review and evaluate the effectiveness of their Urban Runoff programs to determine the need for revisions to their LIPs as necessary in compliance with the 2010 MS4 Permit and document revisions in the Annual Report.

3.2.4 Water Quality Management Plan

According to the National Resource Council, there is a direct relationship between impervious cover and the biological condition of downstream receiving waters. HCOCs and Pollutant concentrations are two immediate concerns related to Urban Runoff. Therefore, the Regional Board has set forth requirements to address specific concerns for different types of land development activities. WQMPs have been implemented throughout the SAR in order to address requirements of the 2010 MS4 Permit. WQMPs are a component of each Co-Permittees' LIP and focus on individual new and redevelopment projects targeting HCOCs as well as Pollutants of Concern to maintain, restore, and improve water quality.

The WQMP is a document required forNew Development and Significant Redevelopment projects in order to ensure compliance with the requirements of the 2010 MS4 Permit. The 2010 MS4 Permit requires preparation of a WQMP for all projects within the SAR that meet the "Priority Development Project" categories and thresholds; if not, a Project-Specific WQMP is generally not required. Threshold guidelines used to determine if a project falls under a category that requires a WQMP are summarized in the WQMP Manual as well as the 2010 MS4 Permit. Co-Permittee staff will determine in each case when and how the WQMP requirements and guidelines are applied. A summary of the WQMP requirements for New Development and Significant Redevelopment projects as well as procedures for WQMP compliance and approval can be found in the SAR WQMP.

Typically, infiltration BMPs are prioritized as the preferable BMP choice when trying to meet WQMP and HCOC requirements. Because infiltration can be used toward HCOCs and Pollutant reduction, it is important to note that the SWCT[2] should be used as a tool that would help identify areas where Urban Runoff infiltration is an appropriate action, as well as locations where it may be infeasible given soil, geologic, or groundwater conditions. Those locations that cannot be clearly designated would require a more detailed level of assessment, consistent with the 2010 MS4 Permit requirements, in order to determine the feasibility/appropriateness of Urban Runoff infiltration. The WAP and SWCT[2] would then be integrated into the WQMP development process, providing consistency in interpretation and facilitating reviews.

The benefits of this approach include cost savings, comprehensive and consistent technical analyses, and simplicity, resulting in straight-forward guidance that will assist the Permittees and property owners to easily identify locations where infiltration or other technical solutions should occur. It would also help the Permittees determine whether a stormwater offset program could be developed to encourage investments in areas where additional Urban Runoff infiltration would provide water supply and water quality benefits. Coordination with such agencies as the Eastern Municipal Water District and the Chino Basin Water Master, and coordination with local developers within the SAR has identified support for capture and infiltration of Urban Runoff, as prioritized by the 2010 MS4 Permit, as an important way to augment and enhance the reliability of local water supplies. Many technical issues would need to be worked out as part of the development of an integrated WAP.

Because the WAP incorporates all of the important aspects of the water resources in the SAR which are required to be protected, most of the goals of the WAP are incorporated in the WQMP requirements. WQMPs are tracked within the SWCT[2] so interested parties can have a better understanding of past and current projects within the SAR and the limitations within a development project's sub-watershed.

3.3 TMDL and Hydromodification Coordination

The goal for the programs discussed within the WAP is to protect and improve water quality through an integrated watershed management approach.

Section 303(d) of the CWA requires that, every two years, the State must update the list of waterbodies for which Water Quality Standards (Beneficial Uses and Water Quality Objectives) are not attained, or are not expected to be attained, with the implementation of technology-based controls. TMDLs incorporate WLAs in order to meet these Water Quality Standards. TMDLs are an important tool for the Permittees to achieve water quality goals and are incorporated in the WAP and discussed in detail in Section 4.

The Hydromodication Management Plan will describe how the delineation of existing non-armored or soft-armored stream channels within the SAR will be used on a per-project, sub-watershed, and watershed basis to manage Hydromodification caused by Urban Runoff. The District and permittees continue to evaluate hydromodification as it relates to flood risk and prioritize project opportunities within their respective capital improvement programs and land development processes. Currently, potential Hydromodification impacts are addressed within the

Project-Specific WQMPs and the permittees flood risk reduction efforts during the development review process.

The Hydromodification Susceptibility Mapping that is included in the Regional Geodatabase is another useful tool for the Permittees to use to meet Water Quality Standards as well as recharge groundwater and help restore the Beneficial Uses of Receiving Waters in the SAR. Hydromodification focuses on matching hydrologic conditions between the post-and pre-development during the 2-year storm event. In order to match pre-development runoff conditions, developments typically retain or detain runoff which directly reduces flood control risk for those channels not engineered for the capacity of the 2-year storm event through the reduction of runoff volume and flow. These requirements, along with current and anticipated implementation plans that agencies throughout the SAR are undertaking, are covered in Section 4.

3.3.1 Consolidated Program for Water Quality Monitoring

In order to have an effective monitoring program to accurately characterize Urban Runoff, the District administers the CMP in the SAR for the Permittees. The CMP includes both Storm Event and Dry Weather event monitoring of MS4 outfalls and Receiving Waters throughout Riverside County. The 2010 MS4 Permit allows the Permittees to develop a Monitoring Plan for the SAR that is included in the CMP in order to meet requirements of the Monitoring and Reporting Program.

4 WAP Components

4.1 NPDES MS4 Permit & DAMP

The Urban Runoff Pollution control effort is a result of more than three decades of legislative work, beginning with the Federal Water Pollution Control Act, which, as amended, is now commonly called the CWA. The SAR DAMP plays an important role for this implementation. In summary, the CWA prohibits discharge of Pollutants to Waters of the United States from a Point Source, unless the discharge is in compliance with an NPDES Permit. The final ruling for the NPDES Permit Application regulations for Phase I Stormwater Discharges became effective on December 17, 1990, and is commonly called the "Phase I Stormwater Regulations". These regulations have not been revised.

The Phase I Stormwater Regulations are regulated nationwide through the U.S. Environmental Protection Agency's (USEPA) NPDES program. In California, the Phase I stormwater regulations require that the management program for an MS4 include an in-depth planning process that includes public outreach/participation and relevant intergovernmental coordination to minimize the discharge of Pollutants to the MEP by utilizing management practices, control techniques and systems, design and engineering methods, and other measures. The Phase I regulations define who is covered, prescribes a variety of mandatory information-gathering, planning, and reporting activities, and a compliance schedule.

The Permittees within the SAR obtained an "early" MS4 Permit from the Regional Board on July 13, 1990 for Urban Runoff from areas of Riverside County within the SAR. The SAR MS4 Permit was renewed and revised in 1996, 2002 and again in 2010. Each revision identified specific areas within the Santa Ana River Watershed within Riverside County that are not regulated under the SAR MS4 Permit. The 2010 SAR MS4 Permit regulates discharges of Urban Runoff from MS4 facilities within the Santa Ana River Watershed within Riverside County owned and/or operated by the Permittees. The 2010 SAR MS4 Permit required that the Permittees review and update their programs consistent with the current MEP standard.

In November 1991, the District, Riverside County, and the Cities of Beaumont, Corona, Hemet, Lake Elsinore, Moreno Valley, Norco, Perris, Riverside, and San Jacinto entered into a formal NPDES Stormwater Discharge Permit Implementation Agreement (Implementation Agreement) for the SAR. The reason for the Implementation Agreement was to outline the responsibilities of the Permittees and to provide for funding for program elements implemented regionally. The Implementation Agreement has been amended to add the Cities of Canyon Lake, Calimesa, Eastvale, Menifee, Murrieta, and Wildomar, to address additional requirements of the 2010 SAR MS4 Permit and establish the responsibilities of the Permittees as defined in the 2010 SAR MS4 Permit. The 2010 MS4 Permit requires the Permittees to annually evaluate the Implementation Agreement by November 30th to determine the need, if any, for revision.

The District, in its role as Principal Permittee, administers or participates in multiple interagency programs in conjunction with the Santa Ana River Watershed. These programs benefit the SAR, but may also look at bigger picture topics. The interagency programs include:

- CASQA efforts to support true source control initiatives;
- SQSTF;
- Southern California Stormwater Monitoring Coalition (SMC);
- Hazardous Materials Emergency Response;
- Household Hazardous Waste (HHW) Collection/ABOP Program;
- Commercial/Industrial Compliance Assistance Program (CAP);
- Various public education and outreach programs;
- Middle Santa Ana River TMDL Task Force;
- Lake Elsinore/Canyon Lake TMDL Task Force;
- Southern California Water Committee Stormwater Task Force;
- San Jacinto River Watershed Council; and
- Regional Stakeholder Workgroups such as:
  - Lake Elsinore / San Jacinto Watershed Authority; and
  - SAWPAs OWOW Planning Efforts.

The WAP is intended to meet the requirements set forth in the latest MS4 Permit applicable to the SAR in providing a long-term, holistic approach to address water quality impacts. This goal is to be achieved through integration of water quality, watershed protection principles and policies. Implementation of the WAP improves integration of planning and approval processes with water quality and quantity control measures.

4.2 TMDLs

As previously discussed, Section 303(d) of the CWA requires the State to update the list of waterbodies for which water quality standards (beneficial uses and water quality objectives) are not attained, or are not expected to be attained. The list includes a description of the pollutants causing impairment and a schedule for developing a TMDL for each pollutant. The TMDL is the maximum load of a Pollutant that can be discharged from Point and Nonpoint Sources without Impairing Water Quality Standards. A TMDL must include WLAs for Point Source discharges, load allocations for Nonpoint Source discharges, and a margin of safety. TMDLs are implemented by those entities who are assigned WLAs and Load Allocations. Multiple TMDLs exist within the SAR and will be incorporated into the $SWCT^2$ in order to track the progress of each. Table 1 identifies the current approved TMDLs in the SAR.

Table 1: Current Approved TMDLs in the SAR

WATER BODY NAME	POLLUTANT
Canyon Lake	Nutrients
Lake Elsinore	Nutrients
Santa Ana River, Reach 3	Bacterial Indicators

Point Source discharges are controlled effectively through implementation of the Regional Board's core regulatory program. Nonpoint Source discharges remain the most significant source of Pollutants in many of the waters in the SAR. TMDLs are an important part of the Regional Board's regulatory program for assessing and controlling Nonpoint Source contributions to Pollutant loads. Measures developed for the Plan for California's Nonpoint Source Pollution Control Program and the Nonpoint Source Management Plan's three tier approach (voluntary compliance, regulatory encouragement, issuance of waste discharge requirements) are and will be utilized to develop effective TMDL implementation programs for Nonpoint Source discharges. Modification of MS4 Permits, permits for individual industrial and construction facilities/activities, watershed planning, and the involvement of stakeholders are also important parts of effective TMDL development and implementation. TMDLs are incorporated into the Basin Plan as a Basin Plan Amendment (BPA). Once a TMDL has been incorporated into the Basin Plan, the Regional Board is responsible for ensuring TMDL implementation and effectiveness. The implementation and monitoring phase requires just as many staff resources (if not more) as were used to develop the TMDL itself. Even if local agencies or private interests are responsible for implementing components of the TMDL, Regional Board resources are required for reviewing and negotiating specific implementation strategies, providing oversight of the implementation program (which could include enforcement), monitoring and assessment of the TMDL effectiveness, and revision of the TMDL, if necessary.

The Permittees are participating in several studies in conjunction with the Stormwater Monitoring Coalition (SMC), SWQSTF, the Lake Elsinore and Canyon Lake TMDL Task Force, the Middle Santa Ana River (MSAR) TMDL Task Force, and Southern California Coastal Water Research Project (SCCWRP) to address the elevated Pollutant levels. TMDL Implementation Plans have been set forth for the MSAR and the San Jacinto River Watershed. These plans consist of collecting outfall monitoring data, site identification, and site prioritization yearly for further evaluation in the next phases of the Urban Source Evaluation Plan (USEP) Resolution No. R8-2008-0044. The monitoring requirements set forth in the 2010 MS4 Permit require the Permittees to implement a "Consolidated Program for Water Quality Monitoring", (CMP), to evaluate BMP effectiveness in the SAR. Effectiveness is evaluated based on the WLAs and a specified compliance date for the specific TMDL. The Permittees are also required to revise the DAMP to incorporate the results of the USEP and/or other studies. The DAMP revisions include implementing schedules for meeting WLAs, recording results of the USEP and/or other studies, BMP effectiveness evaluations, and evaluating compliance with the WLAs for Urban Runoff by

initiating a WLA pre-compliance evaluation monitoring program. WQMP revisions to incorporate BMPs per the USEP as well as development of a CBRP to achieve compliance with the WLAs by the compliance dates are also required. Specific information regarding WLAs, task force members, and other TMDL-related information can be found in the Order and the Basin Plan.

4.2.1 Middle Santa Ana River Bacterial Indicator TMDL

In February 2005, the Regional Board amended the Santa Ana River Basin Plan to incorporate the MSAR Waterbodies Bacterial Indicator TMDLs. The Amendment was adopted by the Regional Board in August 2005, and approved by the Regional Board and Office of Administrative Law on September 1, 2006. The TMDLs were approved by the USEPA on May 16, 2007.

4.2.1.1 Comprehensive Bacteria Reduction Plan

In response to the TMDL and MS4 Permit requirements, the CBRP was developed for the SAR. The CBRP is a long-term plan designed to achieve compliance with Dry Weather condition (April 1st – October 31st) WLAs for Bacterial Indicators established by the MSAR Bacterial Indicator TMDL. The CBRP was developed collaboratively by the Permittees participating in the MSAR TMDL and the MSAR TMDL Task Force. The need for the development of the CBRP, and ways in which the Compliance with the WLAs can be measured is discussed in Appendix D.

Currently the Permittees have been implementing water conservation programs which directly reduce the amount of dry weather runoff in the SAR. Municipalities have existing stormwater/urban runoff management and discharge control ordinances prohibiting the discharge of domestic waste from sewer line overflows, septic tanks, portable toilets, boats, and animal feces. Typical ordinances make unlawful the failure to exercise due care or control over an animal such that solid waste is to allowed to be deposited on any public sidewalks, parks or other public property, or private property.

As part of CBRP implementation, the Permittees have re-visited the existing ordinances that address any type of animal waste and looked at ways to enhance waste management requirements, compliance and enforcement. Penalties or fines are included as part of their existing ordinanceAlong with the non-structural source control BMPs currently being implemented and planned throughout the SAR, the permittees are enforcing structural BMPs for New and Re-Development Projects through the use of WQMPs.

4.2.1.2 MSAR TMDL Task Force

The MSAR TMDL Task Force was formed to implement TMDLs adopted by the Regional Board to address exceedances of the fecal coliform objective established to protect the REC-1 use for waterbodies located within the MSAR. The Task Force is represented by a number of key watershed stakeholders, including the Regional Board. With formal adoption of the MSAR Bacterial Indicator TMDL on August 26, 2005, all responsible parties named in the TMDL began the process to create a formal cost-sharing body, or Task Force, to collaboratively implement a number of requirements defined in the TMDL. Task Force participants include:

- Riverside County Flood Control and Water Conservation District
- County of Riverside
- Cities of Corona, Eastvale, Jurupa Valley, Norco and Riverside
- San Bernardino County Flood Control District (SBCFCD) (representing the Cities of Chino, Chino Hills, Fontana, Montclair, Ontario, Rancho Cucamonga and Rialto)
- Cities of Pomona and Claremont (Los Angeles County, pending formal agreement)
- Agricultural Pool and Milk Producers
- U.S. Department of Agriculture, U.S. Forest Service
- Regional Board
- SAWPA

SAWPA serves as administrator of the Task Force. In this role, SAWPA provides all Task Force meeting organization/facilitation, secretarial, clerical and administrative services, management of Task Force funds, annual reports of Task Force assets and expenditures, and hiring of Task Force authorized consultants. All documents and presentation (including CBRP presentations to the Task Force) are posted on SAWPA's project website at: www.sawpa.org/roundtable-MSARTF.html.

4.2.1.3 MSAR TMDL Monitoring Plan

A watershed-wide compliance monitoring program was established in 2007 and will continue as designed during CBRP implementation. A report summarizing sample results from Dry Weather conditions is submitted to the Regional Board by the end of each year. A three-year summary (or Triennial Report) is due to the Regional Board by February 15th every three years since TMDL adoption. The first of these reports was submitted on February 15, 2010. The second was submitted on February 19, 2013. The CBRP provides detailed information regarding monitoring activities, milestones, responsible parties, and reporting scheduling. As part of the CBRP, the watershed-wide compliance monitoring program will continue to be the primary means of evaluating progress toward meeting the WLA for Dry Weather.

4.2.2 Lake Elsinore and Canyon Lake NutrientTMDL

In 1994, the Regional Board declared that Lake Elsinore was not meeting Water Quality Standards because of nitrogen and phosphorus exceedances. Lake Elsinore was then placed on the 303(d) list because of the Impairment of the following Beneficial Uses: warm water aquatic habitat (WARM), and water contact and non-water contact recreation (REC1 and REC2).

In addition to Lake Elsinore, the Regional Board also deduced that excessive nutrients were causing Impairment of Beneficial Uses in Canyon Lake. Canyon Lake was included on the 303(d) list in 1998. The following Beneficial Uses were identified as Impaired by nutrients: municipal water supply (MUN), warm water aquatic habitat (WARM), and water contact and non-water contact recreation (REC1 and REC2).

Regional Board staff prepared the Lake Elsinore Nutrient TMDL Problem Statement and the Canyon Lake Nutrient TMDL Problem Statement in October 2000 and October 2001, respectively. The reports summarized the Impairments caused by excessive nutrients and provided preliminary recommendations for numeric levels to ensure protection of the Beneficial Uses. After the Problem Statements were completed, numerous studies were conducted by the University of California at Riverside, Regional Board staff, and the Lake Elsinore San Jacinto Watershed Authority to create the Nutrient TMDLs. The Final Nutrient TMDLs were adopted on December 20, 2004.

4.2.2.1 Comprehensive Nutrient Reduction Plan

The background for the development of requirements, of the CNRP is described in Appendix E. Watershed based BMPs such as street sweeping, debris removal, septic system management, LID, land use conversion, and public education and outreach are currently being implemented throughout the region. Projects for in lake remediation within Canyon Lake and Lake Elsinore have also been implemented and documented by the Permittees. Watershed BMPs that are being implemented which provide a quantifiable nutrient reduction include street sweeping and MS4 debris removal, structural BMPs implemented through the requirements of WQMPs, septic system management, LID in urban areas. Results have been documented and are provided in the CNRP along with anticipated reduction projections within the region.

Compliance with the Urban WLAs will require implementation of nutrient mitigation activities in both the San Jacinto Watershed and the lakes. Accordingly, the CNRP is built around a framework that includes both watershed-based BMPs and in-lake remediation activities. Coupled with this framework is a monitoring program to evaluate progress toward compliance with Urban WLAs and an adaptive implementation program to provide the opportunity to make adjustments to the CNRP, where deemed necessary to achieve the Urban WLAs. The Permittees submitted a CNRP to the Regional Board on January 31, 2013, and are expecting approval at the July 19, 2013 Regional Board hearing.

4.2.2.2 Lake Elsinore and San Jacinto Watersheds Authority

The Lake Elsinore and San Jacinto Watersheds Authority (LESJWA) is a joint powers authority charged with improving water quality and protecting wildlife habitats, primarily in Lake Elsinore, but also in Canyon Lake and the surrounding watersheds. LESJWA was formed in April 2000 after California voters passed Proposition 13, a bond measure to fund water projects throughout the state. LESJWA is made up of representatives from SAWPA, the Elsinore Valley Municipal Water District, the City of Lake Elsinore, the City of Canyon Lake, and the County. LESJWA was formed to coordinate solutions to water quality problems to protect local water supplies. LESJWA brings together member agencies and stakeholders to identify comprehensive solutions to water and habitat problems that no single agency could address.

LESJWA harnesses the local knowledge of past clean-up efforts in Lake Elsinore and Canyon Lake and the surrounding watersheds to develop a comprehensive watershed cleanup plan. LESJWA also has created a Technical Advisory Committee to provide expert research and to

ensure that each recommended cleanup project is based on current scientific data. In 2006, the TMDL stakeholders formally organized into a funded TMDL Task Force.

4.2.2.3 Monitoring and Implementation Plan

CNRP implementation includes inspection criteria used to identify and manage urban sources which most likely cause the exceedances of urban WLAs. The following key implementation activities are taking place:

- Watershed-based BMPs to reduce nutrient loading in Urban Runoff, primarily Wet Weather flows.
- In-lake remediation projects to mitigate nutrient impacts from in-lake sediments. Separate remediation projects are included for Lake Elsinore and Canyon Lake.
- Watershed and in-lake monitoring activities to assess compliance with TMDL WLAs.
- Optional special studies to develop data to support BMP implementation or provide the basis for revisions to the TMDL.
- Providing a summary in the MS4 program's Annual Report of all relevant data from water quality monitoring programs.

Specific BMPs being evaluated, implemented, and tested within the San Jacinto Watershed and within the lake are discussed in the CNRP for Lake Elsinore and Canyon Lake Report. Monitoring activities have been implemented in phases since adoption of the TMDL. The Permittees, as participants in the Task Force, prepared the Lake Elsinore and Canyon Lake Nutrient TMDL Monitoring Plan in February 2006 and have conducted water quality monitoring on Lake Elsinore and Canyon Lake subsequent to the Regional Board's approval of the Monitoring Plan in March 2006. According to the CNRP, this TMDL Monitoring Plan includes three components:

- Lake Elsinore – Provide data to evaluate compliance with interim and final nitrogen, phosphorus, chlorophyll a, and dissolved oxygen numeric targets.
- Canyon Lake – Provide data to evaluate compliance with interim and final nitrogen, phosphorus, chlorophyll a, and dissolved oxygen numeric targets.
- San Jacinto River Watershed – Provide data to evaluate compliance with interim and/or final nitrogen and phosphorus TMDL WLAs and Load Allocations.

The original monitoring program included a three-phase approach. Phase 1, referred to as the Intensive Lake Elsinore and Canyon Lake Study, focused on an evaluation of the in-lake processes. Phase 2, referred to as the Intensive Watershed Study, focused on data analyses that supported TMDL compliance and provided data to understand external nutrient source contributions from the watershed. Phase 3, known as Compliance Monitoring, focuses on monitoring activities to take place subsequent to Phases 1 and 2 in order to assess in-lake and watershed water quality levels. Detailed Phase 1 monitoring activities can be found in Table 2-1 of the CNRP.

In December 2010, the Task Force, in consultation with the Regional Board, revised the Phase 1 monitoring program for Lake Elsinore and Canyon Lake. The revised Phase 1 program decreases the number of sample locations in the lakes. The watershed monitoring program was not revised.

The CNRP is a dynamic document to allow for the inclusion of updates regarding changes due to BMP effectiveness, technology innovations, reporting criteria, or changes in the San Jacinto Watershed. Through Fiscal Year 2014-2015, the Permittees plan to continue the existing Phase 1 monitoring program and eliminate existing in-lake monitoring programs through the same period. Eliminating in-lake monitoring programs ensures that resources are dedicated to facilitating and constructing in-lake BMPs. The Permittees will propose a revised comprehensive watershed and in-lake monitoring program by December 31, 2014, based on the final configuration of the in-lake BMPs for both Lake Elsinore and Canyon Lake.

4.3 Hydromodification Assessment

The District continues to protect people, property and the watershed from damage and to conserve, reclaim and save waters for Beneficial Use. To achieve these goals, the District and Permittees continues to prioritize flood risk reduction projects, mitigate erosion and seek out opportunities for stream restoration and non structural floodplain management. Additionally, Section XII.B.4. of the 2010 Santa Ana Region MS4 Permit requires the Permittees to develop a delineation of existing non-armored or soft-armored stream channels within the SAR which may be vulnerable to Hydromodification from New Development and Significant Redevelopment projects. Vulnerability to Hydromodification criteria is discussed in the Hydromodification Susceptibility Documentation and Mapping Report provided in Appendix A. Within two years of completion of this delineation, Section XII.B.5 of the MS4 Permit requires the Permittees to develop a Hydromodification Management Plan (HMP). The HMP will describe how the delineation will be used on a per-project, sub-watershed, and watershed basis to manage Hydromodification caused by Urban Runoff. The HMP will prioritize projects based on risks to water quality. Currently, potential Hydromodification impacts are addressed within the Project-Specific WQMPs and the Permittees flood reduction efforts during the development review process. Permittees are required to address Hydromodification concerns within their WQMPs as well as update their project approval requirements to incorporate updated Hydromodification standards per the 2010 MS4 Permit.

4.3.1 Channel Assessment and Classification

As part of the WAP, the delineation discussed in Section 4.4 must be incorporated into the SWCT[2]. Channels and Streams were categorized into five classifications:

- Engineered, Fully Hardened, and Maintained (EFHM);
- Engineered, Partially Hardened, and Maintained (EPHM);
- Engineered, Earthen, and Maintained (EEM);
- Not Engineered and Earthen (NEE); and
- Natural (NAT).

A desktop study was conducted categorizing each individual stream channel segment into one of the above groups. The desktop study included an examination of as-built plans and aerial photography. The segments that were in question based on limited desktop information were field verified to confirm the classification identified. Field verification included visiting an accessible location along the segment of stream channel. Photographs and notes were taken in regards to the stream channel segment condition and armoring. Any stream channel facilities that could not be accessed and/or were still in question were discussed and verified with the Permittees with jurisdictional responsibility for the facility. A Rapid Geomorphic Assessment (RGA) to identify a potential susceptibility to adverse impacts from Hydromodification was not performed as part of the field visits as these visits were performed to only verify a channel classification and only for sites where the classification needed to be verified based on limited desktop information.

In Section 3 of the Hydromodification Susceptibility Documentation and Mapping Report, the definition, as well as the susceptibility, for each of the stream channel classifications is discussed in detail. Engineered channels are operated and maintained by the Permittees. Ongoing maintenance is anticipated to prevent and correct potential Hydromodification impacts as well as implement necessary channel invert, bank, and over bank improvements to enhance the channels structural integrity and ensure conveyance of the 2-year storm event over the life of the drainage facility. The ability for an engineered channel to facilitate this conveyance mitigates the risk of Hydromodification susceptibility. Each of the five stream channels were designated into two categories as shown below:

Not Susceptible:

- EFHM – The risk for adverse impacts caused by Hydromodification is insignificant due to the armoring of the stream channel segment and the engineered design which would prevent erosion and degradation of the channel.
- EPHM - The risk for adverse impacts caused by Hydromodification is very low due to the partial armoring of the stream channel segment and the engineered design which would significantly lower the risk of erosion and degradation of the channel.
- EEM - The risk for adverse impacts caused by Hydromodification is low due to the engineered design of the stream channel segment which would lower the risk of erosion and degradation of the channel.

Potentially Susceptible:

- NEE – It cannot be verified that the stream channel segment could handle the changes in runoff volume and duration associated with New Development or Significant Redevelopment without degradation. The risk for adverse impacts caused by Hydromodification is potentially significant. Future technical studies could determine the level of risk of Hydromodification in individual stream channel segments.
- NAT – The findings of the MS4 Permit indicate that these stream channel segments are vulnerable to Hydromodification resulting from runoff from New Development or Significant Redevelopment. The risk for adverse impacts caused by Hydromodification

is potentially significant. The level of risk may be determined through future technical studies.

Figures 3 and 4 are the Existing Stream Channel Delineation Map and Stream Channel Susceptibility Map, respectively. These were developed as part of the 2010 MS4 Permit requirements for the WAP and are included in the SWCT[2]. Mapping was done to assist the public and act as a preliminary screening tool. Evaluations for each project should be on a site by site basis. Large river exempted channels and rivers are based on technical studies which have shown that when a receiving water reaches a certain tributary drainage area it will have negligible impacts from upstream reaches. Additional details regarding this exemption will be provided in the HMP. The 10-year inundation level for areas within Prado Dam was identified as not susceptible to Hydormodification because Prado Dam is Controlled Release Point (CRP) and it was evaluated that due to this that up to the 10-year inundation level there was no susceptibility to Hydormodification. This will be further explored and analyzed as a part of the development of the HMP. Upon approval of the HMP, which is scheduled to be submitted January 29, 2014, drainage areas identified as not susceptible to Hydromodification will not need to demonstrate pre- and post-project hydrology for the 2-year return frequency. All other LID/site design and design capture volume standard requirements will still apply as specified in the WQMP.

Figure 3: Existing Stream Channel Delineation Map

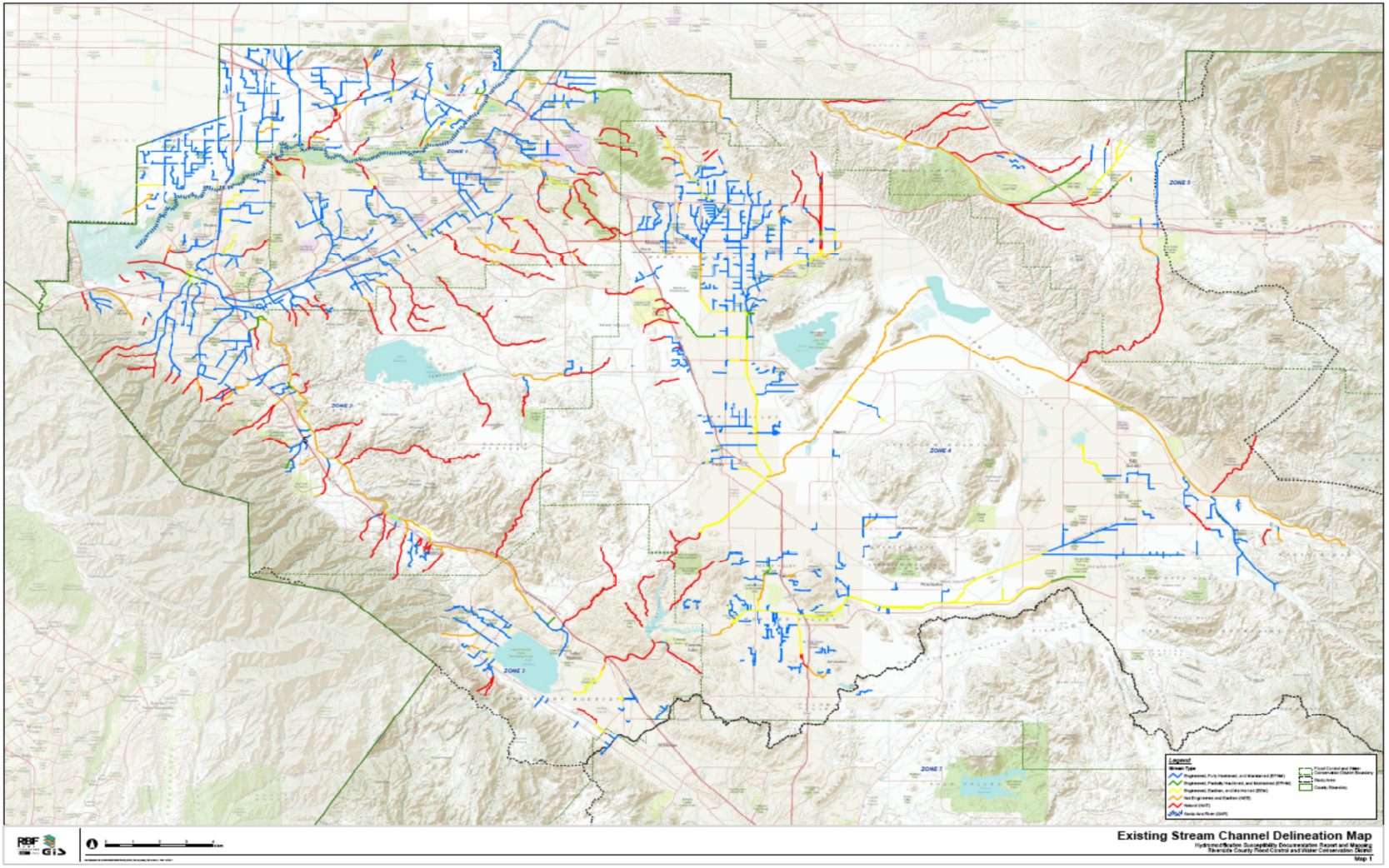
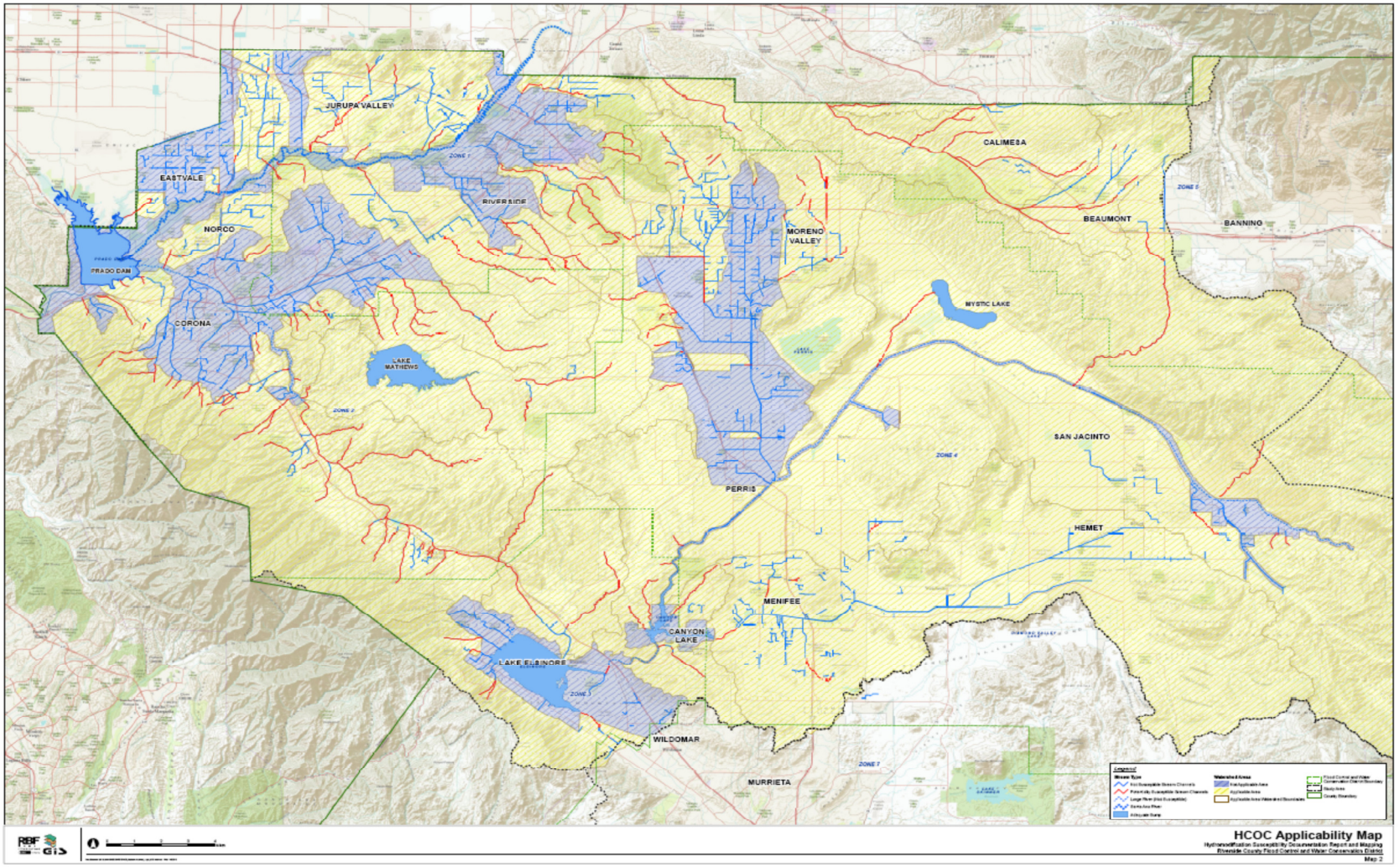


Figure 4: Hydromodification Susceptibility Map



4.3.2 HMP Development

The HMP will identify potential causes of identified stream degradation, including a consideration of sediment yield and balance on a watershed or sub-watershed basis. The HMP will evaluate Hydromodification impacts for the drainage channels deemed most susceptible to degradation. The HMP will prioritize actions based on drainage feature/susceptibility/risk assessments and opportunities for restoration. Supporting studies for cumulative Hydromodification impacts will also be included for additional background and reference.

A Hydromodification Monitoring Plan will also be developed in order to identify monitoring sites, a methodology for assessment of Hydromodification potential, and required follow-up actions to address Hydromodification based on monitoring results. Where applicable, monitoring sites may be used to evaluate the effectiveness of BMPs in preventing or reducing impacts from Hydromodification.

The HMP and the Hydromodification Monitoring Plan may reference existing science and efforts that have already been developed in other areas of Southern California. The San Diego Permittees expended a significant amount of resources in development of their HMP. San Bernardino County and Orange County are currently developing their HMP, and SCCWRP has developed numerous technical papers related to Hydromodification. The geographic differences relative to Hydromodification in Riverside, San Diego, San Bernardino, and Orange County vary; therefore, the information that has been developed with these programs will be evaluated for appropriateness during the development of the SAR HMP. Both the HMP and the Hydromodification Monitoring Plan will use the information that has been developed in the delineation and mapping effort, which provides a significant amount of baseline information. This section will be updated once the HMP has been developed and approved.

The coordinating agencies that will implement the HMP are the Permittees, project owners, and the District.

4.3.3 Hydromodification Monitoring Plan

5 The Hydromodification Monitoring Plan will be as straightforward as possible in answering the key questions about Hydromodification. Consistent with the draft Hydromodification Monitoring Program guidance document currently in development by SCCWRP, the logical approach for Hydromodification monitoring may be annual geomorphic assessment of key "indicator" streams, looking for changes associated with Hydromodification over timeWAP Coordination and Implementation

The WAP will assist the Permittees, water agencies, and the Chino Basin Water Master, as well as the development and environmental communities, to integrate water quality and water supply policies into current and future development plans within the SAR. These policies aim to encourage the capture and use of Urban Runoff to reduce potable water demand and encourage infiltration of Urban Runoff to recharge groundwater basins. The policies and goals covered in the WAP meet requirements specified in the 2010 MS4 Permit.

The WAP is a reference document to assist with the collaboration, and planning toward an integrated watershed management approach within the SAR. The WAP was developed through a collaborative process with the Permittees, and other watershed stakeholders. This section provides a framework for ongoing coordination with the Permittees and Orange and Riverside Counties to establish consistency in the tools for implementation of watershed protection principles throughout the Santa Ana River Watershed. This consistency will help achieve watershed protection principles in each of these jurisdictions. In order to track, link, and readily identify the important aspects within the Santa Ana River Watershed, the SWCT^2 was created. The SWCT^2 is an efficient tool to manage and track data to effectively implement the WAP. The use of the WAP and SWCT^2 is required in the 2010 MS4 Permit to be integrated with the DAMP, WQMP, and TMDLs.

Linking all of the important components of the WAP will create an efficient and effective strategy in order to meet the 2010 MS4 Permit requirements. Integrating the efforts discussed in Section 3 into the WAP and SWCT^2 will provide beneficial synergies for the entire Santa Ana River Watershed. Understanding water supply and demand on a regional basis will help in addressing the water supply issue by increasing public awareness and responsibility. One effective method for helping to resolve water supply is through the WAP and the online SWCT^2, which enables the Permittees to go to the Regional Board and demonstrate the water quality benefit each improvement may provide. Linking the water resource management plans and

programs in the Santa Ana River Watershed may facilitate a more efficient approach to coordinate management of the natural water resources in the Santa Ana River Watershed.

5.1 WAP Watershed Geodatabase

In 2012, the SWCT^2 was created for the SAR. The SWCT^2 incorporates stormwater and groundwater related information, topography, parcel and right-of-way information, soils, Federal Emergency Management Agency (FEMA) flood data, as well as habitat and species information for the entire County. The SWCT^2 locates the flood control facilities including basins, levees, spreading grounds, dams, and other related facilities. The ultimate goal is to be able to have future project proponents identify the MS4 facility the project discharges to, where the facility drains to, the environmental constraints, and the sites downstream for potential restoration and rehabilitation. The online map will eventually be accessible by the public with limited access depending on the role the person has in the project. The online SWCT^2 will also provide template functionality for WQMPs, as well as important requirements regarding the DAMP, LID, and TMDLs. Additionally, regional BMP retrofit studies, plans, and improvements along with other planning tools, such as RCA protection plans, Prado Basin activities, and groundwater related information will also be incorporated into the SWCT^2.

5.1.1 Watershed Action Plan and Watershed Geodatabase Integration

The WAP includes development and implementation of the SWCT^2. This web-based interactive planning tool will assist applicants and agencies in planning development that meets the requirements of the 2010 MS4 Permit through the integrated use of both LID strategies and regional planning. The SWCT^2 will be useful not only for New Development, but for identifying opportunities for infill development and retrofit of existing hardscapes that will provide Urban Runoff capture and related water quality, flood control, and environmental benefits. The integration of the WAP and the SWCT^2 will be developed in coordination with groundwater managers, Permittees, and the Chino Basin Water Master, so that the water supply and associated environmental and public benefits are recognized and incorporated into region-wide planning efforts.

The principles of the integration of the SWCT^2 into the WAP will build upon and leverage a) data and online platforms compiled as part of mapping efforts related to HCOC (stream erosion and Hydromodification), b) studies conducted by the Chino Basin Watermaster that highlight benefits and opportunities associated with infiltration of stormwater (water quality and water resources), c) GIS-based tools and technologies developed by stormwater agencies, consulting professionals, and environmental special interest organizations, d) land use data developed by planning agencies, e) monitoring data, and f) other potential data sources.

The SWCT^2 is intended to aid in integration of the WAP with other stormwater efforts and processes within the SAR, such as the ones discussed in Section 3. An example of this integration will include the ability to use the information in the SWCT^2 to provide significant input to aid in the development of a Project-Specific WQMP. A user who selects a site can be presented with relevant input and supporting reference materials regarding the suitability for onsite infiltration, LID opportunities, relevant and preferred BMPs, identification of downstream stream channel Hydromodification susceptibility issues, and retrofit and restoration opportunities. By using the data maintained in the SWCT^2, the user can be presented with a

template of information to aid in the development of a consistent and complete WQMP, making for streamlined review and approval processes and furthering the goals of the overall watershed on a project-by-project basis.

Another integral part of the WAP involves SAWPA. SAWPA has implemented an IRWMP to help restore a sustainable Santa Ana River Watershed. The main goal of this plan is to have a drought-proofed, salt-balanced Watershed that supports economic and environmental vitality in the year 2030. The IRWMP unites the Santa Ana River Watershed and coordinates expertise and resources to accomplish a sustainable environment. The plan addresses all water-related problems and capitalizes on SAWPA member agencies' successful reputation in watershed-wide planning and problem solving. It envisions a single unified submittal to the State, engenders a collaborative approach to solving problems, allows influence on projects over which the Permittees have no authority, and addresses systematic and long-term needs. The IRWMP is another integral component of the WAP and needs to be incorporated into the Santa Ana River Watershed improvement efforts. Updates and planned activities will be included in the online $SWCT^2$ so the Permittees can monitor and include the ongoing activities of the master plan.

5.1.2 Development Summary

A major component of the final work product under the WAP includes the development, testing, and implementation of the $SWCT^2$ as the primary interactive reference tool. The $SWCT^2$ is designed in such a manner as to allow for continuous live access to the aforementioned data, reports and studies, and data to support other regulatory processes such as WQMP development and approvals, CWA Section 401 Water Quality Standards Certifications (401 Certifications), and LID BMP feasibility evaluations over the internet. The goal is to provide the information in a single, centralized, and maintained location where stakeholders, including developers, engineers, plan checkers, and regulators, can easily access the information. To accomplish this task, the Permittees commissioned the development of an online mapping and data access application using current GIS technology. Furthermore, stakeholder meetings, individual contact, research, and a review of available data and supporting reports and studies were completed to populate the $SWCT^2$. Additional information needed to complete the data requirements for the WAP includes:

- Engineering evaluation of local and regional drainage areas;
- Delineation of existing unarmored or soft-armored drainages that are vulnerable to geomorphological changes due to Hydromodification and those channels and streams that are EHM;
- Hydromodification susceptibility classification of many significant non-EHM facilities;
- Identification of MS4 facilities which pose channel restoration opportunities;
- Identification of sites that pose opportunities for installation of retrofit BMPs;
- Project-Specific WQMP information;
- Groundwater well locations, recharge areas, plumes, contours, basins and aquifers; and
- Reclaimed water systems and LID projects.

Development of the SWCT^2 began in 2012 and will continue to be developed throughout the next year. The database is a living resource and will continue to be maintained and updated on an as-needed basis throughout its existence. The Permittees, resource conservation districts, water and utility agencies, State and Federal agencies, non-governmental agencies, and developers participated in the development of the SWCT^2. They provided comments and input throughout development of the application. A draft version of the application was made available online in 2012, and it has been incrementally updated as additional data and functionality became available. The SWCT^2 is and will remain a work in progress, both from a data standpoint and in its functionality. A data maintenance plan is being finalized. Further enhancements are also anticipated through the implementation of the MS4 Permit requirements to satisfy the additional needs and requests of the Permittees.

5.1.3 Technology

The development of the SWCT^2 has proceeded with the goal of providing a useful and comprehensive reference tool that is easy to use. Design guidelines were employed which should allow users to access most of the site's functionality without training. Further, since the SWCT^2 is browser-based, no additional software needs to be purchased or installed in order to use the application. (The Microsoft Silverlight browser plug-in is required. Silverlight is free and usually takes less than a minute to download and install). In addition, a comprehensive help document and quick start guide are included in the site. However, in order to access some of the more advanced functions and to aid the user in understanding the content of the reference data and supporting studies, some additional training and outreach is being contemplated.

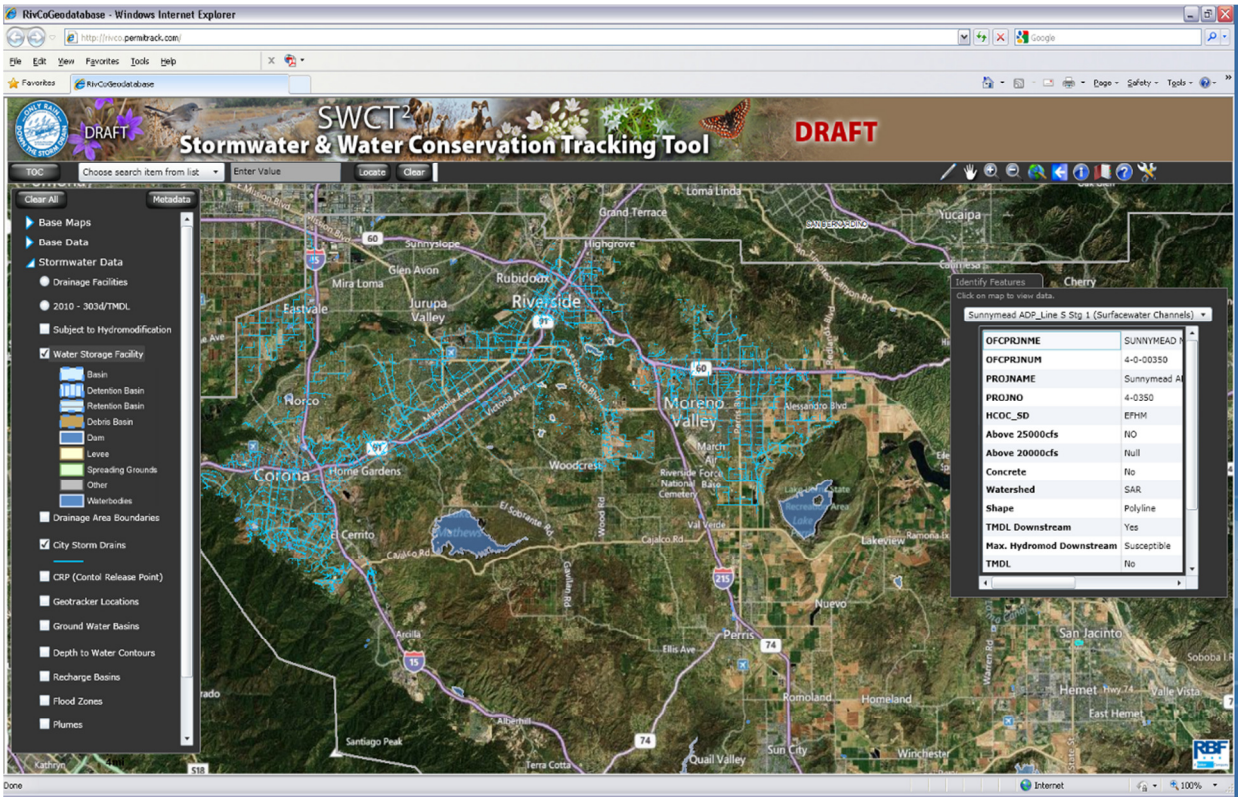
The SWCT^2 depends on state of the art GIS and Internet technologies. The SWCT^2 is powered by two computer servers purchased and maintained by RBF Consulting. These servers include a 64 bit, quad core data server running Microsoft SQL Server as the Relational Database Management System (RDBMS). The geographic components of this data server are supported using ArcSDE version 10.0 by ESRI. The second server is the application server that is connected to the Internet and serves up both the mapping and web pages. The mapping on this server is supported by ArcGIS Server version 10.0 by ESRI. The mapping application is also supported by the Microsoft Silverlight version 4 browser plug-in, which is required to view the media rich content of the site including the mapping. The SWCT^2 has been developed and optimized for the Microsoft Internet Explorer version 7 browser; however, it will operate to varying degrees in other browser environments.

The two servers are currently hosted at a server colocation center, which provides a secure environment, redundant high-speed Internet connectivity, and backup power, as well as regular full and incremental data backups. This internet connectivity will ensure that the SWCT^2 is available to watershed stakeholders via the Internet.

5.1.3.1 Functionality

The SWCT^2 is accessible through the domain address http://rivco.permitrack.com/ (see Figure 6).

Figure 5: SWCT^2 Mapping Site



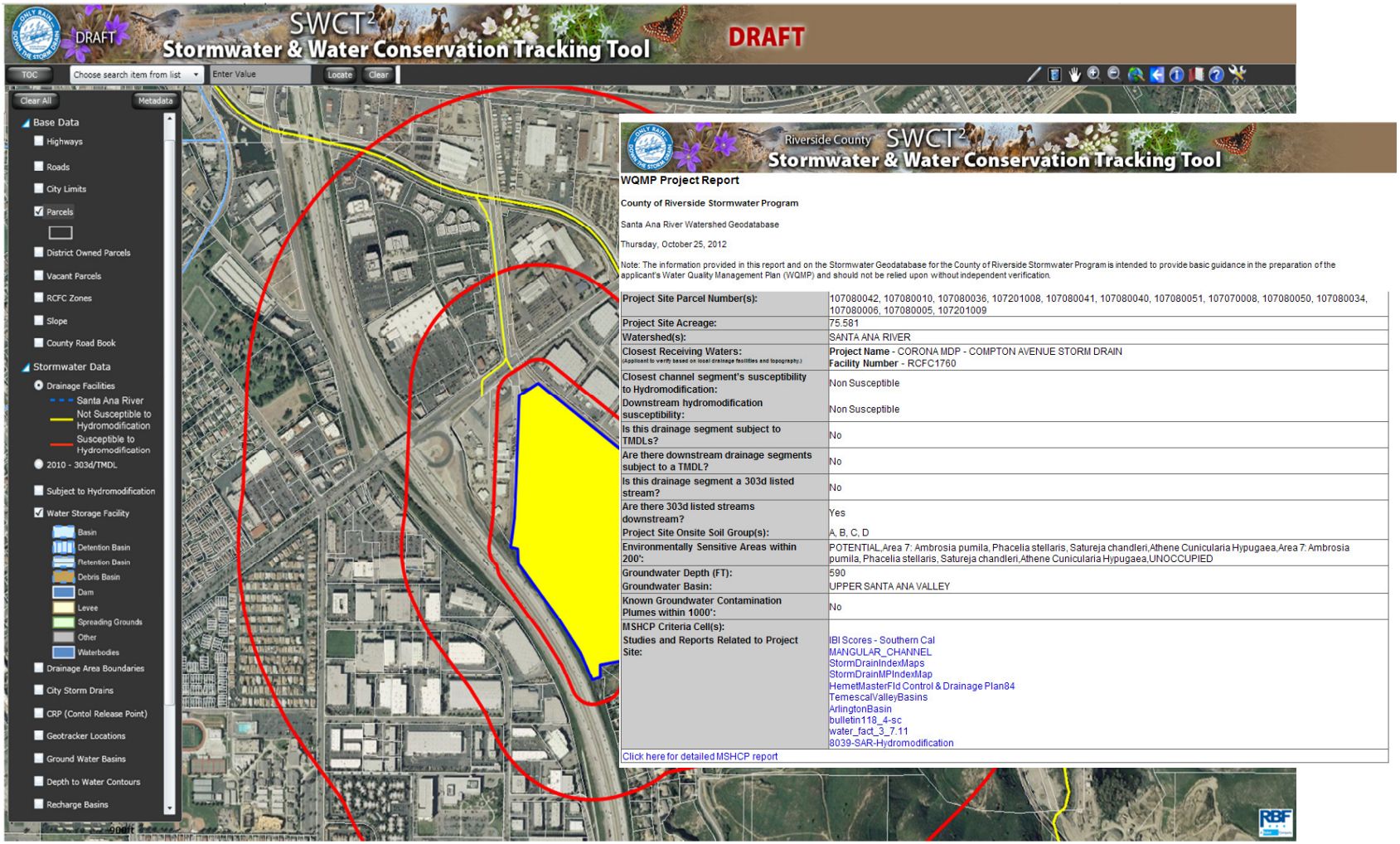
The mapping site (Figure 5) provides basic functionality for opening a map and moving the field of view around the SAR. Currently, while under review by the Regional Board and other stakeholders, the site requires a password for access. One password is available at this time for general access. The password will be provided upon request. As the application develops, multiple passwords will be provided to focus the application and data organization for the type of user logging in.

The SWCT^2 has the following functionality, capabilities, and layers which are implemented in the Silverlight environment.

- Navigation tools: Pan, Zoom In, Zoom Out, Zoom Extents, Back Extents, Identity, Measure
- Searches: Find City, Find Channel by Project Name, Find Road Book Page
- Reports: Find and View Reports
- Base Map Layers: ESRI World Topographic Map (http://goto.arcgisonline.com/maps/World_Topo_Map), ESRI World Street Map (http://goto.arcgisonline.com/maps/World_Street_Map), ESRI World Imagery (http://goto.arcgisonline.com/maps/World_Imagery), Highways, Roads, Parcels, Vacant Parcels, Flood Control District Owned Parcels, Counties, City Limits, County Road Book, Slope

- Stormwater Data: Drainage Facilities, 2010-303d/TMDL, Subject to Hydromodification Areas, Water Storage Facilities, Drainage Area Boundaries, Permittee MS4 Facilities, Control Release Points, Geotracker Locations, Depth to Groundwater Contours, Groundwater Basins, Recharge Basins, Flood Zones, Plumes, Soils, As-Builts
- Habitat/Species Data: Amphibians, Plants, Birds, Fish, Mammals
- Other Basic Functionality: Map Print, Map Legend, Image disclaimer, Help page, Metadata for each layer
- Developer Tool: Allows a project proponent to select an area or parcel to find important information related to the project and the surrounding area including, but not limited to 303d and TMDL information, Soil Types, ESAs, groundwater information, stream channel susceptibility to Hydromodification, Receiving Waters, MS4 facilities, parcel numbers, and other related studies such as WQMPs and MSHCP reports. Figure 7 shows an example of the Developer Tool

Figure 6: SWCT^2 Developer Tool



Main stormwater reference layers included in the site are listed below. A complete list of data included in the SWCT^2 is presented in the data maintenance section, and the data dictionary is provided in Appendix C:

1. MS4 facilities including channels and basins
2. Stream segments susceptible to Hydromodification
3. Local and regional drainage boundaries
4. Controlled release points -Controlled release points act as a measured conveyance drainage system in order to detain and/or retain runoff. These points are critical for flood control protection, Hydromodification mitigation, and/or water quality effectiveness.
5. Sensitive species and Protected Habitat areas, California Department of Fish and Wildlife, and the U.S. Fish and Wildlife Service
6. Potential stormwater recharge areas and/or reservoirs
7. Groundwater basins including groundwater surface contours
8. Groundwater contamination plumes
9. NRCS soil classifications
10. 303(d) listed waterbodies, addressed TMDLs, and associated Pollutants

Additional reference material is provided in the form of links to supporting documentation. These mainly include:

1. Construction and as-built drawing documents for Permittee MS4 facilities;
2. Relevant Stormwater and Groundwater Documents and Studies collected to support the WAP; and
3. System-wide Retrofit Opportunity Exhibits and Studies linked to individual identified sites. .

5.1.4 Maintenance and Enhancement Schedule

Over the course of the development of the SWCT^2, the Permittees collected or commissioned the creation of data layers that are pertinent to the WAP. One of the main objectives of the SWCT^2 is to develop and implement a plan to keep the reference material provided on the SWCT^2 web site up to date. This data maintenance plan will assist with identifying data layers that are included in the SWCT^2, the source of the data, the party responsible for data maintenance, the frequency of maintenance, and the last time the data layer was updated. Further, since many of these layers are maintained simultaneously by multiple agencies, this data maintenance plan will identify a specific source and maintenance responsibility to determine best maintenance practices and eliminate duplication of effort. The data maintenance plan indicates that the District will evaluate and update as necessary each of the data layers with a minimum frequency of semiannually unless a specific data set has a known longer update cycle.

In collecting the required data layers, the consultant coordinated the data collection effort through the District to collect various data layers relevant to the project at hand. The consultant

obtained much of the needed base layers to assist with the project over a period of time from project initiation in early 2012. The consultant evaluated the data in the second and third quarters of 2012 to organize, update and when necessary clean up data to be suitable to support the WAP. The District worked closely with the consultant's GIS Department to provide the necessary support for the collection of data layers that would support the project. During the data collection phase of the project, data was noted, inventoried, and tracked into a data dictionary to document what was collected and to track what datasets were the most current data available.

Throughout the development of the $SWCT^2$ the consultant contacted agencies and water districts to collect data needed to support the project. The District provided the bulk of applicable data and is the prime source for downloads and updates as needed. Through the District, the consultant also made contact with each of the Permittees throughout Riverside County including agencies throughout the Whitewater Region, Santa Margarita Region, and the SAR. The Permittees provided data as available for their jurisdiction and as appropriate to the needs of the project. Groundwater agencies such as the Chino Basin Watermaster and the Western and Eastern Municipal Water Districts were among some of the other agencies contacted to obtain the relevant information, although the Municipal Water Districts have not yet responded. Overall, the requests and collection of data was a large cooperative effort and most involved parties were responsive.

The data included in the $SWCT^2$ consists of base layers such as parcels, street centerlines, Permittee boundaries, roads and District parcels all of which come from the County. The County also provided species and habitat data sourced from the County approved General Plan, the California Department of Fish and Wildlife, and U.S. Fish and Wildlife Service. The District also provided their maintained drainage facilities and water storage facilities. The Permittees and water districts provided layers such as groundwater contours, plumes, storm drain systems, water utilities, and land use. Information from NRCS soils, aquifer and 303d listed waterbodies were downloaded from applicable resource agencies.

A strategic method was implemented for review and data organization to ensure data quality. The data layers were thoroughly examined and compared to existing layers to verify changes and location. Once the data was reviewed, the data was recorded stating the provider, date modified, date to be updated, and file type. A structured file system was created for the data received, organized by data type, and the source of the data. This assisted in identifying what was needed to develop the $SWCT^2$. The data was also used to perform studies to support the WAP including stream channel assessment, hydromodification susceptibility, and causes of stream degradation. The data layers presented on the site and maintained in support of the WAP are shown in Table 1.

Table 1: WAP Data Layers

Feature Class	Source	Responsible Party	Proposed Frequency of Updates	Date Last Updated
Parcels	TMLA	District	Quarterly	7/1/12
District Parcels	District	District	Quarterly	Unknown
District Zones	District	District	As needed	Unknown
Reports	RBF	District	As needed	9/1/12
Transportation Road Book	RCTD	District	Annually	Unknown
Vacant	TLMA	District	Quarterly	Unknown
Amphibian Survey	TLMA	District	Quarterly	7/1/12
Burrowing Owl Survey	TLMA	District	Quarterly	7/1/12
Centerlines	TLMA	District	Quarterly	7/1/12
Cities	TLMA	District	Quarterly	7/1/12
Counties	TLMA	District	Quarterly	7/1/12
Criteria Area Species Survey	TLMA	District	Quarterly	7/1/12
Criteria Cells	RCA	District	Quarterly	7/1/12
Desert Tortoise Areas	TLMA	District	Quarterly	7/1/12
Highways	TLMA	District	Quarterly	7/1/12
Mammals Survey	TLMA	District	Quarterly	7/1/12
MSHCP Boundary	TLMA	District	Quarterly	7/1/12
Narrow Endemic Plants Survey	TLMA	District	Quarterly	7/1/12
Steven's Kangaroo Rat Habitats	TLMA	District	Quarterly	7/1/12
Waterbodies	TLMA	District	Quarterly	7/1/12
Water Districts	TLMA	District	Quarterly	7/1/12
Watersheds	TLMA	District	Quarterly	7/1/12
Depth to Water Contours	SAWPA/ CBW	District	Annually	SAWPA 1980 - 2006, Chino Basin Spring 2010
FLOOD	District, FEMA	District	Quarterly	Unknown
FEMA Flood Zones	FEMA	District	When updates are Available	8/1/08
Geotracker Locations	WRCB	District	Quarterly	10/1/2012
Groundwater Basins	CBW, Corona	District	Annually	Unknown
303d Lines	WRCB	District	Bi-Yearly or when Approved updates are available	4/1/2010
Plumes	SAWPA	District	Bi-Yearly or when Approved updates are available	unknown
303d Polygons	WRCB	District	Bi-Yearly or when Approved updates are available	4/1/2010

Feature Class	Source	Responsible Party	Proposed Frequency of Updates	Date Last Updated
Soils	SSURGO	District	Yearly or when updates are available	9/1/12
Soils dissolved by Hydro Unit	SSURGO	District	Yearly or when updates are available	9/1/12
TMDL Polygons	WRCB	District	Bi-Yearly or when Approved updates are available	4/1/2010
TMDL Lines	WRCB	District	Bi-Yearly or when Approved updates are available	4/1/2010
Critical Habitat - San Diego Ambrosia	USF&W	District	Annually	Unknown
Critical Habitat - Nevins Barberry	USF&W	District	Annually	Unknown
Critical habitat - Brodiaea Filifolia	USF&W	District	Annually	Unknown
Critical Habitat - Coastal California Gnatcatcher	USF&W	District	Annually	Unknown
Critical Habitat - Vail Lake Ceanothus	USF&W	District	Annually	Unknown
Critical Habitat - least Bell's vireo	USF&W	District	Annually	Unknown
Critical Habitat - Munz's Onion	USF&W	District	Annually	Unknown
Critical Habitat - Yellow-Legged Frog	USF&W	District	Annually	Unknown
Critical Habitat - Spreading Navarretia	USF&W	District	Annually	Unknown
Critical Habitat - Peninsular Bighorn Sheep	USF&W	District	Annually	Unknown
Critical Habitat - Quino Checkerspot butterfly	USF&W	District	Annually	Unknown
Critical Habitat - Riverside Fairy Shrimp Final Critical Habitat	USF&W	District	Annually	Unknown
Critical Habitat - San Bernardino Kangaroo Rat	USF&W	District	Annually	Unknown
Area Subject Hydromod	RBF	District	Annually or as needed	8/1/12
City Storm Drain	City List	District	Yearly	Unknown
City Storm Points	City List w/o Wildomar	District	Annually	Unknown
Control Release Locations	RBF	District	Annually or as needed	9/1/12
Drainage Area Boundaries	Corona	District	Yearly	Unknown
Major Watersheds	USGS NHD, Permittees	District	Yearly or as needed	9/1/12

Feature Class	Source	Responsible Party	Proposed Frequency of Updates	Date Last Updated
DistrictStorm Points	District	District	As needed	Unknown
District Storm Polygons	District	District	As needed	Unknown
Recharge Basins	Corona	District	Annually	Unknown
Regional Watersheds	USGS NHD, Permittees	District	Yearly or as needed	9/1/12
Semi-Regional Watersheds	USGS NHD, Permittees	District	Yearly or as needed	9/1/12
Surface Water Channels	District	District	Quarterly	9/1/12
DTM	TLMA	District	Annually	7/1/2012
SLOPE-PERCENT	TLMA	District	Annually	7/1/2012

USGS-NHD - U.S. Geological Survey - National Hydrography Dataset
CBW - Chino Basin Watermaster
WRCB – Water Resources Control Board
USF&W - U.S. Fish and Wildlife
City List - Corona, Eastvale, Moreno Valley, Temecula, Menifee, Murrieta, Norco, Palm Desert, Riverside, Wildomar

The data maintenance methodology has included three methods for delivering updates to the District for inclusion in the SWCT^2. They are as follows:

1. When possible, data will remain at its source (such as the District GIS) and a network link will be developed over the Internet to allow this layer to be viewed as a service within the SWCT^2. This approach, also known as a "Mash-Up," is the most reliable method, because it leaves responsibility for update in the hands of the owner of the original dataset and no additional activity is required to update the SWCT^2. Changes that occur on the source are immediately reflected on the SWCT^2. Likely candidates for this method include the aerial photography, street base map, and parcel layers.
2. When a data service is not available or not possible, the District will seek to accomplish a database synchronization process using ArcSDE. This process synchronizes the changes or "deltas" in the database, including geographic updates without the need for a wholesale replacement of the dataset. This will make the updates quick and simple and provide the most efficient method for updating the SWCT^2 when the source is also using ArcSDE and is willing to participate in this update process.
3. The third update method consists of a standard manual update using a file geodatabase, personal geodatabase, or shapefile as available. This method will be employed for datasets not maintained at the District, and from State and Federal sources for which this is the primary method for data transfer.

The Permittees have created, updated, and imported metadata for the existing data layers in the SWCT^2. Metadata is a vital part of data maintenance and critical to the end-users. A brief description of the data, key words, publication date, and person by whom the data was received

or created was incorporated into the metadata. Over the course of the development of the WAP, the metadata has been updated, and it will continue to be current. The data dictionary, which includes this metadata, is provided in Appendix C, and the metadata has been included in the SWCT^2 simply by clicking on the metadata tab next to any data layer in the table of contents.

5.1.5 Watershed Geodatabase Training and Outreach Recommendations

The development of the SWCT^2 has proceeded with the goal of providing a useful and comprehensive reference tool that is easy to use. Design guidelines were employed which should allow a novice user to access most of the site's functionality without any training. Further, since the SWCT^2 is browser-based, no additional software needs to be purchased and installed in order to use the applicationIn addition, a comprehensive help document and quick start guide are included in the site. However, in order to access some of the more advanced functions and to aid the user in understanding the content of the reference data and supporting studies, some additional training and outreach is being contemplated.

Following the submittal of the Final WAP and announcement to the interested stakeholders for online access to the submitted WAP and SWCT^2, the Permittees will meet to discuss any comments, issues, or updates to SWCT^2. The District will then meet with RBF to discuss the findings from the meeting with the Permittees. The comments provided by the Permittees will then be considered for implementation into the SWCT^2 based on guidance from the District. Additional meetings between the Permittees will be necessary to assist the WAP and SWCT^2 meet their intended goal.

5.2 Coordination and Outreach with Regional Board Staff and Inter-Agencies/Stakeholders

Throughout the development of the SWCT^2, the District as Principal Permittee and stormwater program consultants have been making presentations on the progress of the SWCT^2 including the functionality and the available information. Once the SWCT^2 is available to the public the stakeholders will have the ability to:

- Verify attributes of the SWCT^2, including drainage feature stability/susceptibility/risk assessments; and
- Satisfy its intended use of supporting regulatory processes, such as WQMP approvals, CWA Section 401 Water Quality Standards Certifications (401 Certifications), and LID BMP feasibility evaluations.

Following this submittal, the District will seek to prepare additional targeted presentations and training opportunities for stakeholders to solicit input for improvements, additional data and functionality. Feedback will be compiled and considered. The District will continue to invite and encourage participation and comments from resource conservation districts, water and utility agencies, State and Federal agencies, non-governmental agencies, and other interested parties in the development and use of the SWCT^2.

5.2.1 WAP Coordination and Review Process

Once the WAP requirement was identified in the 2010 MS4 Permit, the District began planning the development of the WAP through coordination with the stakeholders and related agencies. The development of the WAP included multiple phases beginning with a Draft Outline and a Draft WAP Document, followed by the Final WAP Document. Stakeholder meetings were conducted after the submittal of the Draft WAP Outline to provide an opportunity to review each document and provide feedback.

In order to have an effective WAP, involving multiple stakeholders with different perspectives and water resource needs in the review process is necessary. Involvement creates a collaborative integrated watershed management approach to the WAP. This collaborative process serves as an opportunity for the watershed stakeholders to provide input on the WAP and watershed development processes.

Outreach for the Final WAP submittal is recommended. Outreach could consist of presentations at workshops, public hearings, or distribution of materials to related parties. This outreach will provide an opportunity for a variety of input throughout the region that could shed light on priorities in the SAR and how protection of the water resources in the SAR can be achieved. Specific presentations could be prepared for community members, groups, and proponents with varying views and needs. For example, presentations could be provided based on land use types to effectively target interests from parties within or related to these land uses. Such workshops could include project types such as residential, commercial/retail/industrial, parks and public facilities, streets and arterials, utility agencies, and environmental special interest groups. The combined effort from an amalgam of groups would provide an understanding of the underlying themes of the recommendations provided across the different groups. The workshops would provide the opportunity to receive input from stakeholders in the SAR to help formulate the objectives and structure of the WAP. The results of the workshops will be implemented into the WAP document to meet the requirements of the 2010 MS4 Permit.

5.2.2 LIP Coordination

The framework that provides the foundation for implementation of the 2010 MS4 Permit requirements is described in the DAMP. As required under the 2010 MS4 Permit, the Permittee LIPs describe how the requirements of the 2010 MS4 Permit are implemented. Accordingly, the DAMP and the LIP are the principal documents that comprehensively translate the 2010 MS4 Permit requirements into actions that manage water quality in the MS4. Following completion of the WAP, the model LIP will be revised as needed to incorporate the programs coordinated through the WAP.

Local implementation planning provides the critical role of translating watershed protection principles into measurable actions that may be adopted by stakeholder agencies. The focus toward an updated LIP through the efforts of the WAP Task Force Members will provide consistency in a set of approaches that can be adopted at a local level by the Permittees. The results of the District efforts, in conjunction with the watershed stakeholders and the Regional Board, will be adoptable to Permittee requirements based on the application of LID principles while maintaining consistency throughout the SAR in a manner that will address the 2010 MS4 Permit requirements.

The structure of the WAP allows for the watershed priorities and watershed protection principles that were developed through stakeholder meetings to be coordinated and implemented as priorities through the Permittees' LIPs. These watershed protection principles will be specified in the SAR model LIP, which will present a framework for the development of the Permittees' individual LIPs. The Permittees' individual LIPs serve as the tool to implement watershed protection principles are in elements of a jurisdiction's program.

In consideration of the watershed protection principles identified in the WAP and in the Model LIP, a Permittee may implement, when feasible, each of the watershed protection principles based on applicability or where there may be adequate justification inability to incorporate into a Permittee's LIP. The LIP must also show how accepted watershed protection principles will be implemented. It is anticipated that the Permittees will use the WAP SWCT^2 to help them identify the feasibility for implementation of the watershed protection principles. In the next revision of the Model LIP, the concept of accepting or rejecting the watershed protection principles will be incorporated. The next revision of the Model LIP and subsequent updates for each of the Permittee's LIPs will commence after the approval of Final WAP by the Regional Board.

5.2.3 Regional Watershed Opportunities

This section of the WAP develops the progression of necessary tasks that will need to take place for the WAP to commence and continue working to restore and protect the Receiving Waters in the SAR. The development of the WAP has specific interrelationships and this section is meant to collaborate the resources and goals to protect and restore the Receiving Waters in the SAR in a holistic manner.

The identification of WAP principles, linkages, and other relevant efforts were critical in the development of the WAP Objectives. These Objectives provide the background to move forward with further development and implementation of the WAP. In order to create a vehicle to collect, manage, and review important data relative to the SAR, the SWCT^2 was implemented. This SWCT^2 will serve as the tool that can be used to help achieve the objectives of the WAP where detailed watershed information can be accessed by all of the stakeholders in the SAR. This access to information will be critical to achieving the objectives of the WAP.

The specific and regional studies discussed throughout the WAP are the first steps in both understanding some of the watershed processes and identifying potential locations for watershed restoration and water quality improvement. The Hydromodification susceptibility mapping was integrated into the SWCT^2 to help identify those areas that may be subject to additional Hydromodification requirements on a per-project basis. The channel assessment discusses how the existing drainages were classified and also helped to identify locations of opportunities for restoration; the classifications have been incorporated into the SWCT^2. The causes of stream degradation, to be developed as part of the HMP, will help identify where there are issues in the SAR and what efforts can be put in place to reduce the source of the problem. Both the retrofit and restoration opportunities represent potential restoration in the SAR. The results of these efforts have been integrated into the SAR SWCT^2 which can help with future watershed planning efforts.

5.2.4 Watershed Benefit Estimation

Understanding the watershed benefits of any implementation strategy is critical before decisions are made about implementation of regional BMPs. Pollutant removal and Hydromodification reduction impacts may be evaluated through the development of water quality/watershed modeling to provide a better understanding of the benefits that different BMP placement strategies will have upon Receiving Waters. Understanding where susceptible streams and high Pollutant concentrations are located will assist in the prioritization and selection of regional BMP implementation. The Receiving Water priorities should be considered when evaluating alternative BMP implementation scenarios. The locations that will provide the greatest Receiving Water quality and watershed benefits can then be identified and prioritized for construction. The costs of implementation of regional BMPs must also be assessed, and funding must be secured.

The District and permittees continue to evaluate hydromodification as it relates to flood risk and prioritize project opportunities within their respective capital improvement programs and land development processes.

5.3 Long-Term WAP Program Development

The WAP is designed to be a living document so that as more information is developed in the SAR, more barriers to watershed protection principles are identified, and innovative ideas to achieving the WAP objectives are identified, they can be incorporated into the document. Achieving the objectives of the WAP will take time including effective coordination among the Permittees and watershed stakeholders. The WAP Objectives have been defined consistent with the 2010 SAR Permit, and as the WAP is further developed the WAP should also include coordination with Orange and San Bernardino Counties. This Tri-County coordination will allow for successful implementation of watershed protection principles in a cost-effective manner throughout the Santa Ana River Watershed. The WAP document should be used as a reference resource as well as a planning tool for current and future improvement projects within the Santa Ana River Watershed. Review and understanding of the WAP and the role it plays in the Santa Ana River Watershed is beneficial for watershed planning.

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Appendix A: Hydromodification Susceptibility Documentation and Mapping Report

Appendix B: Santa Ana Watershed BMP Retrofit Assessment

Appendix C: Watershed SWCT^2 Data Dictionary

Appendix D: Comprehensive Bacteria Reduction Plan (CBRP) Summary

The need for the development of the CBRP is described in the Findings section of the 2010 MS4 Permit, e.g.:

- Section II.F.7 – "The MSAR TMDL Implementation Plan assigns responsibilities to specific MS4 dischargers to identify sources of Impairment, to propose BMPs to address those sources, and to monitor, evaluate, and revise BMPs as needed, based on the effectiveness of the BMP implementation program. These are generally considered as the short-term solutions. The MSAR Permittees are required to develop and implement a long-term solution (a CBRP) designed to achieve compliance with the WLAs by the dates specified in the TMDLs."
- Section II.F.14 – "The Permittees are required to develop a CBRP to achieve compliance with the WLAs by the compliance dates. Periodic evaluation and update of the CBRP may be necessary based on a BMP effectiveness analysis to ensure compliance with the WLAs by the compliance dates."
- Section II.F.16 – "In the absence of an approved CBRP, the WLAs become the final numeric WQBEL that must be achieved by the compliance dates." Based on these findings, the Regional Board established specific requirements for the CBRPs content.
- Section VI.D.1.c.i – "The MSAR Permittees shall prepare for approval by the Regional Board a CBRP describing, in detail, the specific actions that have been taken or will be taken to achieve compliance with the Urban WLA during the Dry Season (April 1st - October 31st) by December 31, 2015. The CBRP must include:

    (1) The specific ordinance(s) adopted to reduce the concentration of Bacterial Indicators in urban sources.

    (2) The specific BMPs implemented to reduce the concentration of Bacterial Indicators from urban sources and the water quality improvements expected to result from these BMPs.

    (3) The specific inspection criteria used to identify and manage the urban sources most likely causing exceedances of water quality objectives for Bacterial Indicators.

    (4) The specific regional treatment facilities and the locations where such facilities will be built to reduce the levels of Bacterial Indicators discharged from urban sources and the expected water quality improvements to result when the facilities are complete.

    (5) The scientific and technical documentation used to conclude that the CBRP, once fully implemented, is expected to achieve compliance with the Urban WLA for Bacterial Indicators by December 31, 2015.

    (6) A detailed schedule for implementing the CBRP. The schedule must identify discrete milestones to assess satisfactory progress toward meeting the Urban WLA during the Dry Season by December 31, 2015. The schedule must also indicate which agency or agencies are responsible for meeting each milestone.

(7) The specific metric(s) that will be established to demonstrate the effectiveness of the CBRP and acceptable progress toward meeting the Urban WLA for Bacterial Indicators by December 31, 2015.

(8) The DAMP, WQMP, and LIPs shall be revised consistent with the CBRP no more than 180 days after the CBRP is approved by the Regional Board.

(9) Detailed descriptions of any additional BMPs planned, and the time required to implement those BMPs will be provided in the event that data from the watershed-wide water quality monitoring program indicate that Water Quality Objectives for Bacterial Indicators are still being exceeded after the CBRP is fully implemented.

(10) A schedule for developing a CBRP needed to comply with the Urban WLA for Bacterial Indicators during the Wet Season (November 1st - March 31st) to achieve compliance by December 31, 2025."

The Permittees have developed the CBRP to achieve compliance with the Dry Season Urban WLA to the MEP by the compliance date of December 31, 2015. Compliance with the WLAs can be measured in several ways:

- Water Quality Objectives are attained at the watershed-wide compliance sites established as part of the implementation of the TMDL (see Section 6). If not attained, then it must be demonstrated that Bacterial Indicators from controllable urban sources are not the cause of non-attainment.
- Compliance with Urban Source WLAs is demonstrated from specific MS4 facilities, e.g., sampling demonstrates that MS4 outfalls or drains are in compliance with the WLA during Dry Weather conditions.
- MS4 facility outfalls are dry, contributing no dry weather flow to downstream waters.

Appendix E: Comprehensive Nutrient Reduction Plan (CNRP) Summary

The need for the development of the CNRP is described in the Findings of the 2010 MS4 Permit:

- Section II.F.23 – Interim compliance (compliance determination prior to the final WLA compliance dates) determination with the WLAs in the TMDLs will be based on the Lake Elsinore and Canyon Lake (LE/CL) Permittees' progress toward implementing the various TMDL Implementation Plan tasks as per the resultant studies and plans approved by the Regional Board. The LE/CL Permittees are required to develop a CNRP designed to achieve compliance with the WLAs by the final compliance date for approval of the Regional Board. In the absence of an approved CNRP, the WLAs specified in the approved Lake Elsinore/Canyon Lake Nutrient TMDL will constitute the final numeric WQBELs.
- Section II.K.4.b.v – The Regional Board recognizes that additional research is needed to determine the most appropriate control mechanism to attain Water Quality Standards for nutrients in these two lakes. The 2010 MS4 Permit provides the LE/CL Permittees the flexibility to meet the WLAs through a variety of techniques. Even though the WLAs for the Lake Elsinore and Canyon Lake Nutrient TMDLs are expressed as WQBELs, if Water Quality Standards in the Lakes are met through biological or other in-Lake control mechanisms, the LE/CL Permittees' obligation to meet the WLAs is satisfied as the Impairment for which the TMDLs were developed would not exist anymore. The Permittees in the affected watersheds are required to develop a CNRP designed to achieve the WLAs by the compliance dates specified in the TMDL. In the absence of an approved CNRP, the WLAs become the final numeric WQBELs for nutrients.

Based on these Findings, the Regional Board established specific requirements for the CNRP's content. These requirements, found in Section VI.D.2.d in the MS4 Permit, need to achieve compliance with TMDL WLAs as per the TMDL Implementation Plans. The LE/CL Permittees have submitted a CNRP in July 2012, describing, in detail, the specific actions that have been taken or will be taken to achieve compliance with the urban WLA by December 31, 2020.

Section VI.D.2.d. of the MS4 Permit specifies that the CNRP must include the following:

- Evaluation of the effectiveness of BMPs and other control actions implemented. This evaluation shall include the following:
    - The specific ordinance(s) adopted or proposed for adoption to reduce the concentration of nutrients in urban sources.
    - The specific BMPs implemented to reduce the concentration of urban nutrient sources and the water quality improvements expected to result from these BMPs.
    - The specific inspection criteria used to identify and manage the urban sources most likely causing exceedances of Water Quality Objectives for nutrients.
    - The specific regional treatment facilities and the locations where such facilities will be built to reduce the concentration of nutrients discharged from urban sources and the expected water quality improvements to result when the facilities are complete.
- The proposed method for evaluating progress toward compliance with the nutrient WLA for Urban Runoff. The progress evaluation includes:

- The scientific and technical documentation used to conclude that the CNRP is achieving compliance with the urban WLAs.
- A detailed schedule for implementing the CNRP. The schedule must identify discrete milestones, decision points, and alternative analyses necessary to assess satisfactory progress toward meeting the urban WLAs by December 31, 2020. The schedule must also indicate which agency or agencies are responsible for meeting each milestone.
- The specific metric(s) that will be established to demonstrate the effectiveness of the CNRP and acceptable progress toward meeting the urban WLAs for nutrients by December 31, 2020.
- The DAMP, WQMP and LIPs shall be revised consistent with the CNRP no more than 180 days after the CNRP is approved by the Regional Board.
- Detailed descriptions of any additional BMPs planned, including BMP implementation schedules, in the event that data from the watershed-wide water quality monitoring program indicates Water Quality Objectives for nutrients are still being exceeded after the CNRP is fully implemented.

The CNRP is applied to the Permittees in the following jurisdictions: County and the Cities of Beaumont, Canyon Lake, Hemet, Menifee, Moreno Valley, Murrieta, Perris, Riverside, San Jacinto, and Wildomar. The Permittees have developed a CNRP that is designed to achieve compliance with the Urban WLAs by the compliance date of December 31, 2020. Per 2010 MS4 Permit Section VI.D.2.k, compliance with the Urban WLAs can be measured using one of the following two methods:

- Directly, using relevant monitoring data and/or approved modeling procedures to estimate actual nitrogen and phosphorus loads being discharged to the lakes, or,
- Indirectly, using water quality monitoring data and other biological metrics, approved by the Regional Board, to show Water Quality Standards are being consistently attained (as measured by the response targets identified in the Nutrient TMDLs).